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Cement for Belting.

C. Phelps of Salem, Mass. informs us that he has had in constant use for eight years, a six inch belt, which is jointed with Russian isinglass as a substitute for rivets. The isinglass for this purpose is applied in the same manner that glue is applied to join pieces of wood together. The end of the belt to be thus cemented, should be scarfed for about six inches lengthwise, then a strong solution of isinglass applied, and the surfaces so treated, brought together and held fast by joiner's screws until they are perfectly dry. "It might be well" says Mr. Phelps, "to put a row of small tacks along the thin edge of the scarf, and clinch them firmly." We would state, although we have never used isinglass for cementing belting, we have oftentimes used it for cementing leather, for various purposes, and have found it to answer well.

Varnish for Iron Works.

Put 28 pounds of asphaltum into an iron pot, and boil it for four hours. During the first two hours of boiling, introduce 14 lbs. of litharge, 3 lbs. of dried copperas, 10 gallons of boiled linseed oil, 8 lbs. of resin, and one of the sulphate of zinc. After four hours of boiling, these ingredients should be of a thick consistency. It is then suffered to cool, and when cold, it is thinned with turpentine, so as to be applied with a brush. It is used for blacking the iron work of carriages, &c. Of course the quantities given may be reduced, if the proportions are retained.

To Make the Oxyd of Gold.

Having received several communications recently making inquiries respecting the mode of preparing the oxyd of gold, we present the following as the best method with which we are acquainted for making it. Dissolve pure gold in two measures of muriatic, and one of nitric acid; and then evaporate to dryness. After this, dissolve the product in twelve times its weight of pure water, and then add a solution of pure carbonate of potash; apply a heat of 170° Fah., and a yellow precipitate falls, this is the hydrated per-oxyde of gold. Wash it well, and then boil it in pure water, when it becomes of a brownish black color which is the oxyd required.

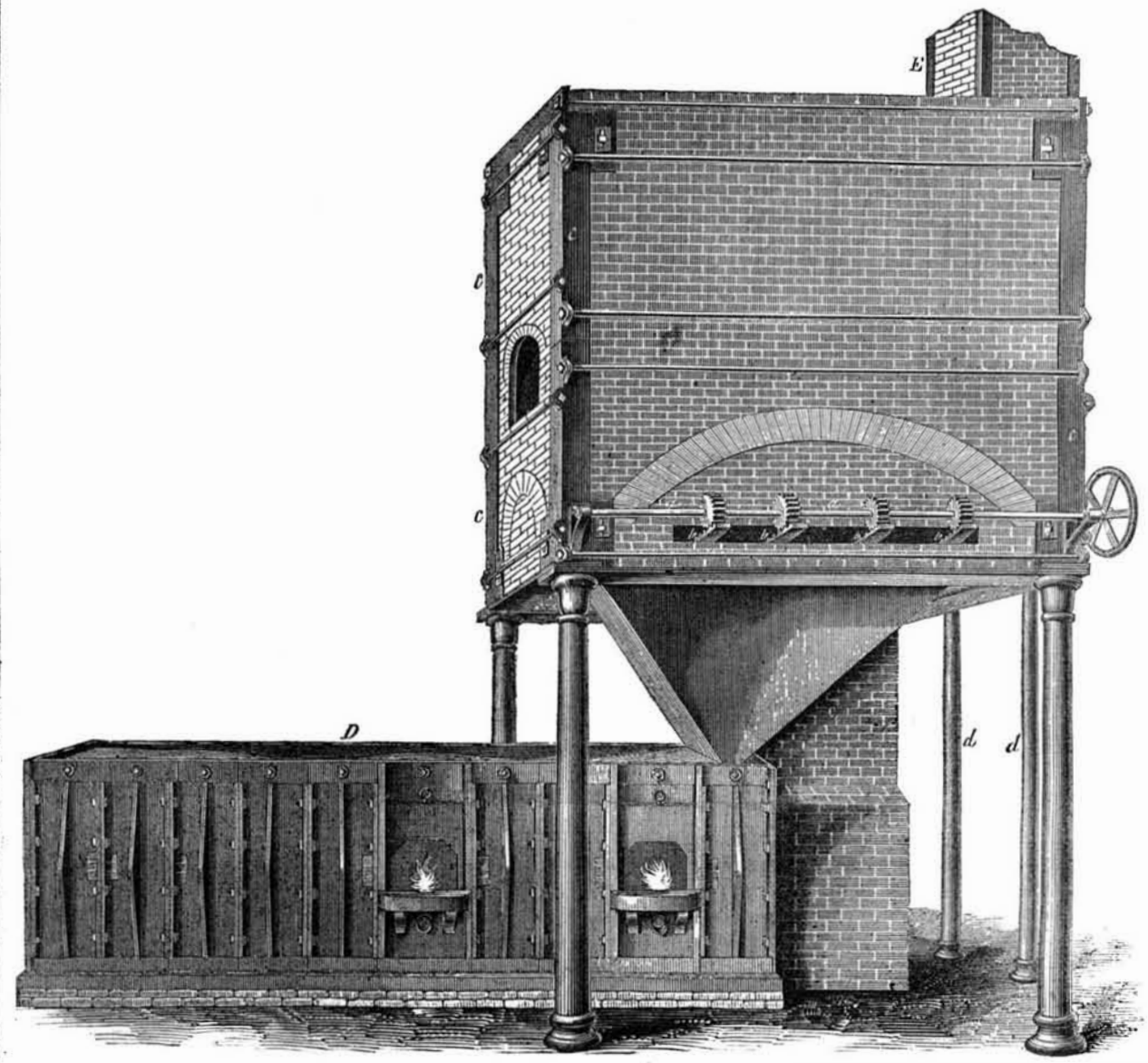
Stopping the Echoing of Halls.

The new Capitol of Nashville, Tenn., reverberated sound in such a manner as to destroy the use of the Legislative Hall, where the voice of a speaker, reverberated like that of a noisy crowd. This has been remedied by spreading a thick layer of sand dust on the floor, covering it with a heavy carpet and curtaining the windows with thick curtains. A similar defect in College Hall, Cincinnati, was remedied by covering the walls with canvas.

Characteristics.

Somebody says there are three kinds of men in this world—the "wills," the "won'ts," and the "cant's." The first effect everything, the next oppose everything, and the last fail in everything. "I will" builds our railroads and steamboats; "I won't" don't believe in experiments and nonsense; while "I can't" grows weeds for wheat, and commonly ends his days in the slow digestion of a court of bankruptcy.

RENTON'S FURNACE FOR MAKING WROUGHT IRON FROM THE ORE.---Fig. 1.



We present our readers this week with illustrations of James Renton's process for the manufacture of wrought-iron direct from the ore, the American and Foreign Patents upon which were obtained through our Agency.

Our readers are aware that the ordinary process of manufacturing iron is both tedious and complicated. The ore, in which the iron is found existing in combination with oxygen, carbon, and sulphur, is first subjected to the process of roasting. This is usually accomplished by piling it in large heaps, over a stratum of fuel which is then fired, and by the combustion of which sufficient heat is generated to calcine the ore. The object accomplished in this roasting, is the separation of the sulphur and the complete oxydation of the ore. After the pile has been sufficiently roasted it is *cleaned*, a process which consists in separating it from the dust and foreign matter which it contains. This is accomplished by means of various devices, consisting of screens, fans, and picking it over by hand.

The ore after being properly calcined and roasted, is generally mixed, the different varieties, when judiciously selected, furnishing a cheaper and better iron than any of them taken separately. It is often the case that some varieties cannot be employed profitably by themselves, but when combined with others, containing less sulphur perhaps, they can be economically worked.

The next step is technically termed "reviving" the iron,—in other words, bringing it from the state of an oxyd or sulphuret, as the case may be, to that of pig iron. This has usually been accomplished in a "blast" furnace, in which the ore, mixed with a due proportion of fuel, and a certain quantity of lime, clay, or other substance employed as a flux, is subjected to a strong heat, generated by the combustion of the fuel urged by a strong blast of cold or hot air, according as the process of "cold blast" or "hot blast" is employed. After being thoroughly deoxydized and separated from the sulphur or other foreign ingredients contained, it is melted, and flowing down to the bottom of the furnace it is drawn off and cast into "pigs." But it is now only cast-iron, and before it is adapted to the manufacture of the various articles for which malleable iron is employed, it must be decarbonized and brought to a purer state. This is done sometimes by transferring the pigs directly to the bloomeries, where, after being broken in pieces of suitable size, they are mixed with a due proportion of charcoal or coke, and heated until the carbon is burned out and the metal brought to a semi-fluid state, when it is drawn from the fire and placed upon an anvil, where, beneath the blows of a trip-hammer, it is converted into "blooms" or large bars of an impure wrought-iron.

In many other cases, however, an intermediate process is employed. The pigs after coming from the blast furnace, are taken to the "finery," as from the very impure condition in which the iron is found, in consequence of the employment of stone coal and the hot blast, it has often been necessary to separate a portion of the impurities before its removal to the forge or bloomery.

But we must not dwell longer on the ordinary process of manufacture. We have referred to it that our general readers may the more readily appreciate the great advantages of the improved process, which we will now proceed to describe.

Fig. 1 is a perspective view of the furnace complete, and fig. 2 is a vertical section of the same.

The ore, after being properly calcined, is crushed by the action of stampers or any other suitable means to a granular state. It is then mixed with about twenty per cent. of carbon in a finely comminuted state, and is thrown in the tubes, *a a*, fig. 2, where it is subjected to a high red heat for about twelve hours. The contents of one or more of the tubes is then let down through the funnel-shaped chamber, *e*, into the preparatory bottom by withdrawing the slides, *b b*, which are then closed, and the tubes filled with fresh ore. The preparatory bottom is that part of the chamber, K, next the chimney. It is here worked for about 20 minutes, when it is passed along to the puddling bottom in the center of the chamber, and is there made in a ball, after which it is taken to the anvil to be wrought into a bloom. *l*, fig. 2 is the fire chamber. The heat of this chamber, after passing over and heating the iron in the puddling chamber, K, is conducted through the flue, *i*, to the flues, *f f*, surrounding the ore-flues, *a a*. It will therefore seen that the whole operation is performed by a single fire. The stack of flues, as can be seen in the engravings, is built upon a heavy bed plate, supported by cast-iron pillar and is formed by a

(*Continued on the Fourth Page.*)

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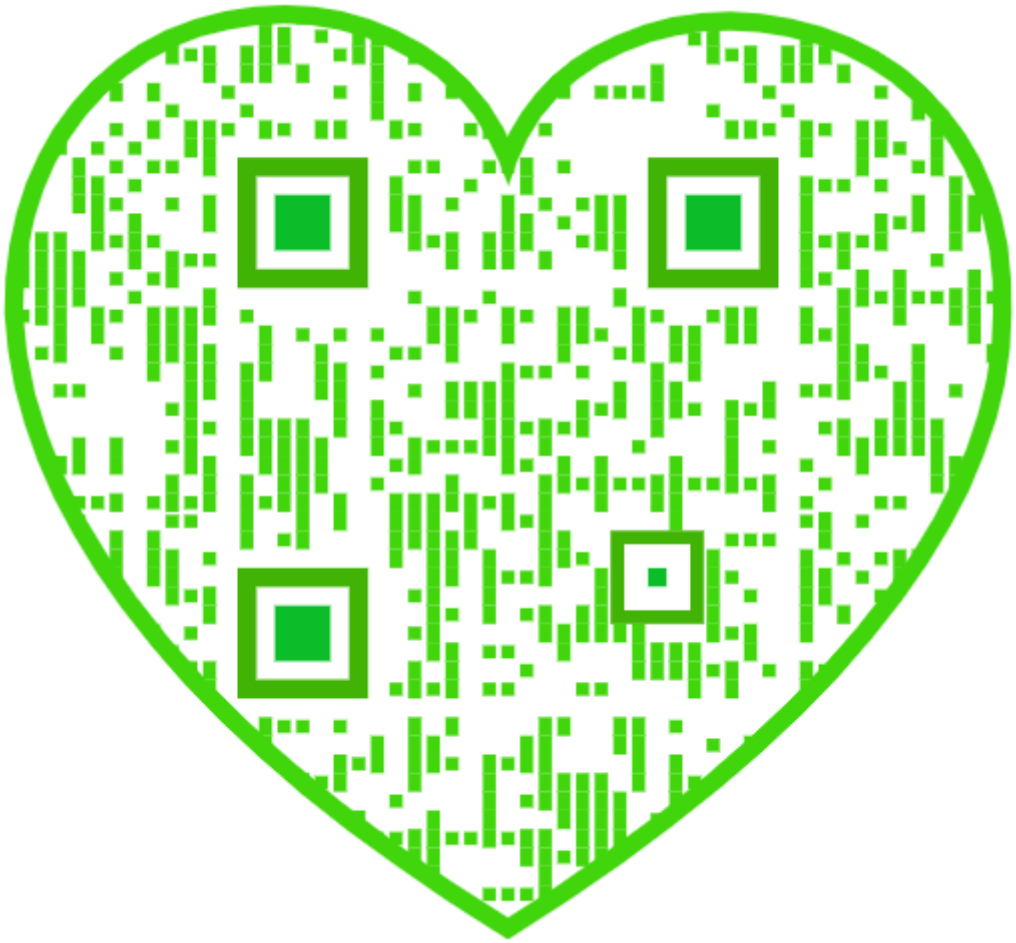
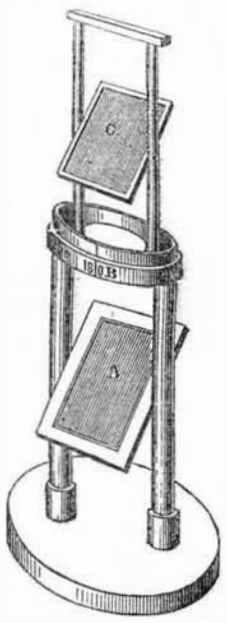


Imponderable Agents.---No. 9.
[Second Series.]

Polarization of Light—Various mechanical arrangements have been invented for the illustration of this remarkable property of light; the polariscope of M. Biot, introduced in 1824, is perhaps the best of its kind. The annexed figure will explain this apparatus. A, is a frame containing a number of plates of glass placed parallel with each other, and termed the polarizing glass; it is swung on two side pillars, in the fashion of a mirror. The tops of the two side pillars carry a circular ring of wood, B into which is loosly fitted a moveable upper circular disc of wood, with a central opening. This upper disc again carries two light pillars, supporting a second frame, C, containing a sheet of glass, painted on the back with lamp black, termed the analyzing glass. The upper wooden ring has an index placed opposite to the middle of the analyzing glass, so as to point to graduations on the outer or lower ring, B. The substances to be submitted to the action of polarized light are placed over the hole in the upper ring, by a small disc of glass forming a supporting stage.



To show the difference between polarized and common light, the polarizing and analyzing glasses are set with their faces parallel to each other, as represented in our figure, and a ray of light, whose angle of incidence is 56°, is allowed to fall upon the polarizing plate, so that it may be reflected to the analyzing one above.—Supposing, now, that the analyzing plate is turned slowly round, the reflected light upon it will become gradually fainter, until it has been turned 90°, when the light will be barely visible. If the motion is still continued onwards, the light will again become brighter until it reaches the opposite 90°, at which point its intensity will be the same as at first. At 0°, and at 180°, the intensity is greatest; and 90° and 270°, it is least. If we suppose the polariscope to be placed with 0, pointing to the south, it follows that when the north or south side of the ray, reflected from the polarizing plate, is towards the analyzing plate, the plate reflects it as a common light; but when the east or west side is nearest the analyzing plate, it is incapable of reflecting the light, and at the intermediate points different degrees are reflected, showing the difference existing between polarized and common light. So far as we at present know, light, in polarization, undergoes no other change than such as is caused by reflection; therefore we come to the conclusion that light is polarized by reflection from glass at an angle of 56°, water 52° 45′, and so on according to the substance used. The fact of the refusal of polarized light to be reflected from the surface of a transparent substance, when it is incident of an angle of 56°, and that it is the same in two positions at right angles to each other, is a clear test of polarization.

The laws of the polarization of light form a distinct science of vast extent and beauty; for, though this property (first observed by Newton) was never experimented on till the present century, yet during this short time discoveries have thickened, and have led, step by step, to higher and higher generalizations, till at length the late French mathematician, Fresnel, was enabled, by a magnificent theory, to bring all these complex and wonderful phenomena under the simple laws of mechanics.

Perhaps the most important rule respecting polarization is, that light coming directly from a source, as the sun or a candle, never possesses this property, while that which has been reflected always possesses it more or less. It is very singular that a ray once polarized retains that property during all its subsequent course, whether that be for inches, miles, or billions of miles. Thus, with no other apparatus than a fragment of a crystal, we may examine the polarizing effect of the far distant surface of the planet Saturn as readily as that of the page before us.—We may ascertain whether a star at the outskirts of the visible universe shines by its own or by reflected light. In this way Arago has proved that, in some of the binary systems, the two stars are two suns, while in others the smaller is only a vast planet reflecting the light of the larger. In this extraordinary observation we cannot fail to be struck with the great disproportion between the means of observation and the fact observed,—and especially with the astounding universality of this agency, light, which at once pervades galaxies and penetrates between atoms.

We have presented no small amount of information on the polarization of light, because it is a subject not generally understood. Although these articles might be extended to a great length, we do not deem it prudent to occupy much more space with them at present, we will therefore conclude the series, in our next number.

Agassiz on the Races of Man.

We give the following from the Boston Traveller's report of Agassiz's lectures, delivered at Lowell, Mass.:

We next come to geographical distribution of the races of man; and here we must leave out of consideration all question as to the unity of the races. Professor Agassiz is conscious that his views, on some points, are not generally received, and he fully respects the motives which make the views of others almost sacred to them. He hopes that his views will be received in the same spirit as he represents them, viz: in the effort to arrive at truth.

We will first study the limits of the range of each race on the different continents, and must consequently eliminate every element depending upon migration, as the present American races. We are to consider the primitive location of the races, that is, the distribution of man as recognized by the earliest traditions.—The question is, where the race was originally placed, rather than what are the modern changes in their distribution.

The first race to be considered is one peculiar to the Arctic regions, a race different much from any inhabiting the temperate zone, and still more from those of the tropics. This race comprises the Esquimaux of this continent, the Laplanders of Europe, and the Samoydes of Asia. They are all characterized by a broad face, short in its vertical diameter, a low forehead, and great length of body, when compared with the shortness of the legs. For more minute descriptions the works of Pickering and Prichard must be consulted. The distribution of the races correspond nearly to the zoological regions of the north.

The races of temperate zones are three.—The Mongolians in Asia, the whites in Europe, and the aborigines in America; and it is remarkable, also, that these races occupy the same territories as the faunas previously described. In Asia has been described the terrestrial Japanese fauna, the insular Japanese fauna, Chinese fauna, and the fauna of the Caspian regions, intermediate to that of Europe and Asia. Inhabiting precisely the same countries, are the Japanese, Chinese and Turks.

The Indians of North America are a distinct race, (on this point Prof. Agassiz disagrees with Dr. Pickering,) differing from the races of the Old World, as the inferior animals of North America differ in species from those of the Old World. It is only within a few years that the animals of North America have been considered not to be identical with those of Europe.—The aboriginal Indian race is identical, from the Arctic regions to Terra del Fuego, the only difference being one of tribes, not of races. These tribes are divided into an infinite number of small tribes, a fact perfectly in accordance with the distribution of the inferior animals upon this continent.

We have seen that a great Mountain chain, extending from the Canadas to Patagonia, connects North and South America, and produces a certain uniformity in their faunas; that their faunas are sub-divided into those of the Pampas, the Antilles, the Andes, the Southern States, the Middle States, the Canadas, the table lands west of the States, and those of Oregon and California. In the same manner the aborgines are sub-divided into a large number of small tribes, which are circumscribed within narrow limits. They form no great nations, as do the Chinese, Tartars and Japanese of the east.

The Caucasian race is widely distributed and divided into many nations. Those inhabiting the eastern part of Africa, the northern part of Arabia, Mesopotamia, Asia Minor, &c., all constitute different nations, with different languages. The Teutonic branch, including the German, Dutch, English, Danish, &c.; the Sclavonian branch, including the Russian, Poles, &c., each have a nationality and language peculiar to themselves. But they all have a feature in common, viz: a noble expression of the face, above that of all other races, a mirror of the innermost movements of the soul, and it is this branch, also, which is capable of the highest moral culture, and the highest degree of civilization.

Africa has one characteristic race—the negro. But the interior of the great desert, Nubia and Abyssinia, have races different from the negro. The Hottentot lives at the south, and the western shores have their peculiar tribes. It was possible, even, during his recent visit to the Southern States, to recognise among the negroes those belonging to these several African tribes.

In the East Indies are three distinct species: the Malay, Telingan, and Negrillo, (like the negro, only dwarfish.) The Australian is a tribe peculiar to that country. The features are those of the negro, but the hair is straight and flowing. The inhabitants of Madagascar are a peculiar tribe, but our information concerning them is scanty. They are not negroes, but resemble more the inhabitants of the Sandwich Islands.

With these facts before us we can assert that there is a law of distribution of the human race, as well as of the inferior races, and that these laws are in accordance with each other.

The Island of Iceland.

The Island is divided into four districts, or Fiordnungs, which are administered by deputies. The ancient laws of the country are still chiefly used; but the law of primogeniture is not known, and land is held either in fee or under long leases from the Crown. The island appears to have been once covered with forests, which are, however, now nearly extinct; only a few dwarf birches and willows are seen, but no trees, and the people are dependant for fuel upon turf or peat. The poorer people suffer much from the severity of the climate and leprous disease, induced by the dirtiness of their habits, and the coarse unwholesome food on which they subsist. Their chief occupation is fishing and raising herds of cattle. In numbers they have greatly diminished; once there are said to have been 100,000 souls in the island; at present, however, the population is supposed not to exceed 48,000 persons. As a people, they are of mild, honest, and religious dispositions, and remarkably well educated, much superior knowledge being found among them which, considering the poverty of the country, is worthy of note. Parents, assisted by the parish priest, are the chief instruments of education, the latter acquiring their means of teaching at a sort of college, or high school, at Bessasted, in the peninsula of Altanese. The Icelandic dialect, is (as well known) a variety of the great Indo-European family of languages, and belongs to the Scandinavian sub-division. An excellent grammar of it has been published by the celebrated Danish philologist, Professor Rask, who lived in Iceland for three years.—This dialect is called by the natives, "Isengkarunga." The Icelanders were early famous for their cultivation of literature, and the skalds, or the poets of the island, have obtained a European celebrity. Many, however, of the oldest songs have been oral, and, having never been committed to writing, have now perished.

Steamboat Inspection.

In November last the Supervising Inspectors of Steamboats, appointed under the Act of August 30th, 1852, met in convention at Cincinnati, and the report of their doings has just been published. It contains the following statistics of the several districts.

LOCAL DISTRICTS.	No. of steam vessels that have been inspected and certificates granted.	No. of pilots licensed.	No. of engineers licensed.	Amount of tonnage inspected.
FIRST DISTRICT.				
Portland,	16	16	11	3,491
Boston,	20	24	19	8,568
New London,	16	18	7	4,926
SECOND DISTRICT.				
New York,	135	161	365	52,229
Philadelphia,	36	60	80	14,560
THIRD DISTRICT.				
Baltimore,	34	60	58	13,112
Norfolk,	8	14	14	2,164
Charleston,	18	32	52	6,865
Savannah,	8	10	20	2,496
FOURTH DISTRICT.				
New Orleans,	87	226	333	26,100
Mobile,	24	102	107	4,800
Galveston,	4	15	17	512
California and Oregon,	(not organized.)			
FIFTH DISTRICT.				
St. Louis,	83	302	254	27,712
Memphis, &c.	17	41	42	2,543
SIXTH DISTRICT.				
Louisville,	72	176	263	19,758
Nashville,	14	70	83	3,401
SEVENTH DISTRICT.				
Pittsburg,	83	148	184	18,392
Wheeling,	24	44	76	5,724
Cincinnati,	81	248	214	22,000
EIGHTH DISTRICT.				
Chicago,	8	30	39	5,321
Detroit,	32	53	53	19,518
NINTH DISTRICT.				
Buffalo,	40	99	86	35.600
Cleveland,	14	49	38	6,870
Oswego,	7	16	11	6,700
Burlington,	7	14	14	4,600
Total,	882	2028	2448	317,968

Lubricating Oils.

Messrs Editors.—In my report upon the test of lubricating oils, published in No. 19 of the "Scientific American," instead of "Devlin & Co." I should have written "Delavergne & Yockney," manufacturers of oil under Cumberland's patent. The present firm is Yockney & Co., No. 67 Exchange Place, New York City. Please rectify my error, and oblige,

Joseph E. Holmes,
Director of Machinery.

Crystal Palace, New York, Jan. 30, 1854.

A Baffling Illustration.

At one of his lectures, Dr. Boynton related that, wishing to explain to a little girl the manner in which the lobster cast the shell when it has outgrown it, he said, "What do you do when you have outgrown your clothes? Throw them aside, don't you?" "Oh, no," replied the little one, "we let out the tucks?" The Doctor confessed that she had the advantage of him there.

Railway Traffic in England for 1853.

From the traffic returns for the past year the total amount appears to be 17,180,530*l*., on 7200 miles of railway, being at the rate of 2386*l*. per mile.

A good cement for luting the joints of steam boilers, pipes &c., is made by mixing equal parts by weight of red lead and black oxyd of manganese in linseed oil, to render it of the proper consistency.

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[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JANUARY 28, 1854.

PRESSES FOR MAKING MINIATURE CASES—H. T. Antho-ny. of New York City: I claim the construction of the platens of a press for applying the covering materials to miniature and other like cases, by forming the face which gives the pressure of elastic materials, whereby the embossed or other raised figures and ornaments will not be obscured or injured during the process, while at the same time a superior quality of work is produced, as set forth.

DAGUERREOTYPE PLATE HOLDER—P. H. Benedict, of Syracuse, N. Y.: I claim the arrangement of a vise or analogous device upon the side or edge of blocks used for holding daguerreotype plates while they are being polished or buffed, the vise constructed as described, and operating by holding the bent edge of the plate between its jaws.

CULTIVATORS—By Enos Boughton, of East Bloomfield, N.Y. I do not claim any part of the raising and depressing device; nor do I claim the knife or the wheels separately.

I claim the combination of the knife with the wheels, for the purpose of cutting up the ground and destroying thistles or any other weed, plants, or grasses therein.

FIXING LIKENESSES IN MONUMENTS—Wm. Boyd, of Garrettsville, Ohio: I claim combining with a monument or grave stone, a case having a concave mirror set in the back part, and having also within it a miniature likeness of the deceased, which may be kept secure from the action of the weather, or from liability to receive other injury, said miniature being attached to the cover of the case in such a way, that by opening the cover the likeness may be viewed by reflection in the mirror, as set forth.

FOUNTAIN PENS—By Wm. Cleveland, of Orange, N. J.: I do not claim the employment of capillary action to supply the ink to the pen except when used under an arrangement and combination, consisting in the employment of the leading stem so fixed in the delivery aperture that it shall lead the ink down on one side of the aperture and allow the air to enter the other, as set forth.

PRESSES FOR MOULDING GLASS—By Wm. O. Davis, of Pittsburgh, Pa.: I claim the combination of the rocking shaft, connecting rods, swinging beam, and toggle joint lever: or their equivalents, as described, for the purpose of procuring a vertical pressure in presses, together with the mode of attaching them, so as to relieve the bed-plate and frame-work of the press of any strain.

DIVIDED RAILROAD AXLES—By S. L. Denney, of Christiana, Pa.: I claim the gradual conical enlargement terminating in the more abrupt curved portion, toward the inner end of one part of the axle, in combination with the alloy surrounding it and the adjustable connecting box, arranged and operating as described.

[See engraving of this invention on page 52 of this volume, Sci. Am.]

COTTON PRESSES—C. J. Fay, of North Lincoln, Me.: I claim the use of the slats or guide strips, arranged as set forth.

SAW MILLS—E. W. Johnson, of Perth Amboy, N. J.: I claim the arrangement of mechanism for driving two saws, or gangs of saws, and placing the whole upon the bed plate, as set forth.

PROPELLERS—Harry Leach, of Boston, Mass.: I claim the specified improvement in constructing a propeller, viz., of a combination with each of its arms, of two parts or floats, projecting in opposite directions, and an opening or passage arranged between them for the escape of back water, as described.

APPARATUS FOR CLEANING AND BUFFING DAGUERREOTYPE PLATES—Thomas Longking, of Brooklyn, N. Y.: I do not claim the buffing wheel nor any of the parts separately.

But I claim, first, fitting the revolving cushion with the ring, by which the canton flannel or similar covering is secured to the cushion, or removed, and a new cover substituted when required, as specified.

Second, I claim the arrangement of the gearing and shafts, by means of which the cleaning cushion is combined with the buffing wheel, as set forth.

QUARTZ CRUSHERS—T. O. Cutler, of Jersey City, N. J.: I claim the employment of balls to act by centrifugal action due to their rotation about a common center, as specified, when the said balls are combined and act against the inner periphery of a shell or concave which rotates on a common axis with the balls, and which, by reason of its rotation, distributes and holds the material to be ground, &c., in the concavity of the said shell, as specified.

SHUTTER HINGES—Harvey Lull, of South Coventry, Ct., (assignor to Harvey Lull and Richard Porter, of Wheeling, Pa.) Ante-dated Jan. 2, 1854: I claim the so forming of a self locking shutter hinge, cast in two pieces, as that the blind or shutter hung thereon may swing open or shut on a horizontal plane and lock, when opened to its limit, and so that also when locked open, the strain shall be taken off from the spindle and thrown on to cam arms, and thus effectually relieve the spindle from the weight or strain of the shutter, as described.

ROLLERS FOR SCARFING THE EDGES OF SKELPS FOR LAP WELDED TUBES—James McCarty, of Reading, Pa.: I claim a pair of roller constructed, arranged, and adjused as described, so as to bevel the opposite edges of skelp plates of different widths on opposite sides of the same.

STEAM HAMMERS—J. L. L. Morris, of Reading, Pa.: I do not claim attaching the hammer to a beam, which is operated by a piston in a steam cylinder, when the hammer is connected rigidly to the beam, as that would be equivalent to what is known as the "helve" steam hammer.

I claim, first, admitting steam to the cylinder above the piston, and exhausting the steam therefrom through ports, which are opened and closed by an annular valve working in the cylinder itself, or in a steam chest which is placed above, and forms a continuation of the cylinder, as described.

Second, I claim the combination of a bell crank latch lever with a trigger or catch, or other shape capable of operating as described, when the fulcrum of the said latch lever is attached and stationary in relation to the hammer block, and one end or arm is attached to the connecting rod of the hammer block and receives the necessary movement to actuate the trigger or catch, to set free the valve rod by means of a continuous descent of the connecting rod after the hammer is arrested by striking the blow, as set forth.

[This is a good improvement. See notice on page 20, this Volume.]

ELECTRO-MAGNETIC ENGINES—Chas. G. Page, of Washington, D. C. Patented in England May 3, 1851: I claim the employment of the axial action or force of the electric current as a mechanical agent or motive power for the various purposes named, the power being produced by the combination or united operation of a helix or helices, an axial bar or bars of iron, and a cut-off, or its equivalent, for regulating the motion of the axial bar or bars, under a general arrangement in principle, as set forth.

And I claim also the employment of co-operating electro-magnets or armatures, in combination with axial bars, helices, and cut-off, or its equivalent, substantially as set forth.

Lastly, I claim the employment of square wires in the construction of helices for electro-magnetic purposes, as set forth.

[This invention of Dr. Page is published on page 65, Vol. 7, Sci. Am., with a full description.]

WATER GAUGES FOR STEAM BOILERS—Wm. Palmer, of New York City: I claim the use of the double tubular case in combination with the lever, having a float at one end working in one of the tubes, and a compensating plate or equivalent device, at the other, working in the opposite tube, for the purpose set forth.

I also claim the use of the lever having a float at one end of it and a compensating plate at the other, whether working in a double tubular case or otherwise, in combination with an upper and lower rod valve for operating a bell by means of the steam escaping through these valves, whether using the paddle wheel or any equivalent device for that purpose, to indicate the minimum or maximum of the water in the boiler as set forth.

MANUFACTURE OF SHEET-IRON—E. G. Pomeroy, of Pittsburg, Pa.: I do not claim the use of the described materials, in combination, as a paint or composition that may be forced into the surface of iron.

But I claim incorporating, as described, solid carbonaceous matter with the surface of iron so as to protect it from oxydation and beautify it at the same time.

CONSTRUCTION OF PRINTING BLOCKS—Benj. Underwood, of Brooklyn, N. Y.: I claim the peculiar construction of the type described, so that when combined in a case such as specified, any given design may be produced for printing oil cloths, carpets, or other fabrics, as fully set forth.

I also claim the formation of blocks for printing oil cloth carpets or other fabrics by the combination and arrangement of sections or type, such as described, by which an endless variety of patterns may be produced from the same sections variously disposed, at a comparatively small cost.

CARPET BAGS—F. J. Thring, of New York City: I claim constructing the carpet bag with its top and bottom of equal or nearly equal widths, and arranging round its front a strong metallic frame, and attaching to the front and near the center of said metallic frame, by hinges or loose joints, a metallic swinging cover, which extends from the center to the top of the frame, and has a ledge on its inner face, the said cover serving to close up the mouth of the bag, and in connection with the metallic frame to keep out all dust and rain. The whole being constructed, arranged, and operating in the manner specified.

MACHINE FOR PAGING BOOKS—By Edward Town, of Jersey City, N. J.: I claim the arrangement of type in spiral columns around a cylinder, for the purpose of printing successive numbers, the cylinder being moved laterally while it revolves by means of a screw on the end of its shaft, as described.

I also claim the right to use any number of cylinders on a single machine, as set forth.

STEAM HAMMERS—P. L. Weimer, of Reading, Pa.: I make no claim to being the originator of not admitting steam into the cylinder until after the hammer has struck its blow: the same being effected by others, although by different arrangement of device from that which I employ.

I do not claim admitting steam into the cylinder of steam hammers by means of the recoil of the anvil caused by the blow of the hammer.

But I claim the arrangement of the toggle, the catch, two arms, the weight and shaft, for the purpose of opening the valve admitting steam into the cylinder from the concussion or spring of the anvil in its bed, caused by the force of the blow of the hammer.

CHURNS—I. L. Dickinson, of Richmond, Ind.: I claim the combination of the movable or rotating dashers, with the breakers, as described, so that said breakers may remain stationary, while churning and revolve with the dashers to collect the butter, as described.

FURNITURE CASTERS—Le Roy S. White, of Chicopee, Mass.: I do not claim making the shank of the caster detachable from its socket: nor do I claim the employment of a spring to hold the shank in the socket; nor the arrangement of said spring in a groove made in and around the shank, and the making the spring to bear against the internal surface of the socket made without a groove.

But I claim the arrangement of the sustaining groove of the spring in the socket, instead of in the shank, so that when the shank is being drawn out of the socket, or when it is within or out of the same the spring will remain in the socket.

And in combination with the spring and groove made in the socket, I claim to make the groove of the shank with its upper side flaring and the upper end of the shank beveling, as described, the said flare of the side of the groove and the top rendering the shank capable of being detached from or attached to the socket.

RE-ISSUE.

OPENING AND CLOSING GATES—S. G. Dugdale, of Richmond, Ind. Patented originally Oct. 11, 1853: I claim, first, opening, closing, fastening, and unfastening the gate, by moving the bottom of the gate in an oblique direction from and to the post upon which it is hung, as specified.

Second, I also claim the use of the pendulous and vertical levers and arms in combination with the hinges of the gate, as set forth.

DESIGNS.

CANNON STOVE—William Resor (assignor to Wm. and R. P. Resor & Co.) of Cincinnati, Ohio.

COOKING STOVE.—By Conrad Harris and P. W. Zoiner, of Cincinnati, Ohio, assignor to Alex. Bradley, of Pittsburg, Pa.

COOKING STOVE—Peter Seibert (assignor to Alexander Bradley), of Pittsburg, Pa.

Care of the Eyes.

Dr. Dafter says: "So many women complain of weak eyes, that we have thought it wise to give some directions as to reading and writing, by which the sight may be preserved uninjuried. Observe then, that the light should never be allowed to fall on the paper, or on the eyes of the reader, or writer, but the left side; for then the eyes are not annoyed with the shadow of the pen, as will be the case, when the light comes from the right side. That writing tries the eyes more than reading is a popular error; and, in writing, blueish paper is better for the eyes than pure white. When the eyes feel fatigued, bathing them in cold water will both strengthen and relieve them. In reading great relief will be found if the eyes are turned from the book to some soft and harmonious colors. Brilliant colors, therefore, in paper or paint, should not be chosen for a library or sitting-room, where either reading, or writing, or sewing is going on. For sewing, that peculiarly feminine employment, is quite as trying to the eyes as study; and fine sewing at night is really very injurious, and should be avoided if possible. Generally the eyes should be used, in all these occupations, as much as can be in the morning. Ground glass shades, at night, are bad, as they deaden the light too much; the common paper shade, which concentrates the light downward is better."

The Precious Metals.

TOUGHENING GOLD.—Wolf proposes, in the Practical Hand-book for Jewellers, to fuse the brittle gold in a new crucible, and when melted to throw in one or two pieces of sulphur of the size of a pea, to shake the crucible a little with the tongs, and to cast it rapidly into a heated mould. He also proposes to render small pieces malleable by coating them with powdered borax, and heating them in the blow-pipe flame, until the surface commences fusion.

Both of these methods are resorted to at the United States Mint, but the choice of either depends upon the nature of the accompanying metals that give the gold its brittle character. When there is a quantity of iron present, the gold is fused with a mixture of sulphur, potash, and soda, which will remove it by making the very fusible mixture of sulphurets of iron and alkali. If tin, arsenic or antimony be present, a good flux is a mixture of borax, soda, and saltpeter, the last for oxidizing the foreign metals into their respective acids, the soda to give base to those acids, and the borax to collect the slag. In both these cases a sand or clay crucible is preferable to a black-lead pot, in which last the graphite acts reducingly. Where lead is present this process may partially effect its removal; but it is more completely effected during quartation and by washing the fine gold thoroughly with hot water, after extracting the silver by nitric acid. Another method of removing lead would be to fuse the gold with a little saltpeter, borax, and silica, whereby a fusible slag of oxyd of lead would result, and might be skimmed from the surface of the gold. Palladium and platinum, not unfrequently present in California gold, are also removed by the nitric acid in parting silver from gold. Grains of iridosmin have been observed in California gold, in distinct particles, even after three or more fusions, and seem to have no tendency whatever to enter into an alloy; but, whilst casting such gold, these paticles collect at the bottom of the pot, from their greater specific gravity, and, by remelting in a small crucible, and carefully casting, they may be obtained mixed with a small quantity of gold. The latter is dissolved by nitromuriatic acid, and the iridosmin obtained pure.

PLATINOID METALS.—Platinum is associated with several other metals in the platinum sand which is found in some gold-districts.—They have not been found as a distinct deposit in California, but have been observed in the United States Mint in the operations of assaying and parting. These associated metals are palladium, rhodium, iridium, and osmium, to which we must add the lately discovered metal, ruthenium. They have a sufficient resemblance to be classed together, and are obtained by a similar hydrometallurgic treatment. The grains of iridosmin, alluded to under gold, have been qualitatively examined and found to contain the new metal ruthenium, as was observed by Claus in relation to the iridosmin from other localities. Palladium has been observed, and at times in sufficient quantity to render the gold brittle. The quantities of platinoid metals found in the California gold are small, about 1½lb of iridosmin having been obtained from about 25 tons of the gold, 3-100000, but the greater part has, of course, passed into the coin, the coarser grains only being left.—[By Prof. Booth in the transactions of the Smithsonian Institute.

French Rivers Breaking up.

The breaking up of the rivers of the north of France, after the late heavy snows and severe frost, threatened to cause great damage, but seems to have passed over without either serious collision or inundation. The explosion of the Seine, near the Pont Neuf, as the rising water cracked the frozen crust, was heard a mile. A large police force was ready, all the boatmen had double lashed their boats, the bathing houses were made fast with huge iron cables, and the washerwomen's rafts were hooked into pilasters and parapets. In forty eight hours the river was clear. The Seine rose three feet in half an hour, and the current was laden with icebergs that would have done honor to Spitzbergen.

Arsenic Eaters.

The Styrian peasants, says Professor Johnston, eat arsenic as the Chinese eat opium.—They eat it for two specific purposes—to acquire plumpness and freshness of complexion, and to improve their "wind," so as to enable them to climb long steep mountains without difficulty of breathing. And, strange to hear, these specific purposes are attained. The young poison-eaters are remarkable for blooming complexions, and full, rounded, healthy appearances. The peasant, after dissolving a slight particle of arsenic in his mouth, ascends heights with facility which he could not otherwise do without the greatest difficulty of breathing.

Bed Clothes.

The perfection of dress—day or night—where warmth is the desideratum, is that which confines around the body sufficient of its own warmth, while it allows escape to the exhalations of the skin. Where the body is allowed to remain in its own vapors we must expect an unhealthy effect upon the skin. Where there is too little ventilating escape, insensible perspiration is checked, and something analagous to fever supervenes. Foul tongue, ill taste, and lack of morning appetite betray the result.

Amorphous Phosphorus.

Considerable attention has been drawn of late to a variety of phosphorus bearing the above name, which has been recommended for the manufacture of lucifer matches, &c., both as being less injurious to the health of the workmen, and less apt to ignite on being handled. From the researches of Puttfacken, however, it appears that the substance in question, although undoubtedly possessing the above valuable properties, is merely a low oxyd of ordinary phosphorus, and not, as was supposod, an allotropic modification.

A Remedy for the Vine Disease.

It is doubtless well known to most of our readers, that the vineyards of Southern Europe and the Madeiras have been blighted by a microscopic acarus, the "Oidium Tuckeri," and that the price of wines, raisins, &c., has been considerably raised. It has, however, been ascertained that the use of manures, rich in iodine, enable the vine to resist these destroyers. In certain districts of Spain, decomposed seaweeds are ordinarily used as manure. In those parts in which the amount of iodine in the soil may average 1-600000 the vines have entirely escaped.

California Postage.—Extortion.

We have received many complaints from California respecting the exhorbitant rates of postage charged upon our paper. A subscriber from San Franciso says that he has been charged 75 cents per quarter, postage, upon the Scientific American! We have taken pains to inquire of the proper authorities here, and find that 6½ cents if paid in advance, is all that can be legally charged. We trust that our subscribers there will submit to no such extortion.

Strychnine for Panthers.

A farmer in California recently killed a large panther in the following manner:—"The animal attacked his pig-pen, killing a fine hog and eating about half of it. He then anointed the other half with strychine, and left it on the same spot. The ensuing night brought the depredator again to its feast; and the next morning a huge she-panther and three cubs were found extended lifeless on the ground. The animal was of an extraordinary size, measuring six feet from the nose to the root of the tail, and nine from tip to tip.

Glass bottles were first made in England, about 1558. The art of making glass bottles and drinking glasses was known to the Romans in the year 79, A. D.,—they have been found in the ruins of Pompeii.

The most stupendous canal in the world is one in China, which passes over two thousand miles, and to forty-one cities; it was commenced in the tenth century. A monster work of man.

The largest and oldest bridge in the world is said to be that at Kingtung, in China, where it forms a perfect road from the top of one lofty mountain to the top of another.

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New Inventions.

Improved Lamps.

C. Monnin and W. Booth, of Buffalo, N. Y., have invented an inmprovement in Lamps. The invention consists in dividing the oil chamber from the wick chamber of lamps having their burning tubes connected with them at the bottom, by means of a reticulated partition; and in attaching the shade or deflector which is frustro-conical, to the lamps in such a manner that it may be made to throw the reflected light to any desired position. The lamp may be slid up and down upon a vertical standard. The inventors have applied for a patent.

Inproved Truss Bridge.

William Cumberson, of Brooklyn, N. Y. has invented an improvement in Truss Bridges for Ferries, the nature of which consists in bracing the bridge transversely and longitudinally by means of strong truss braces, whereby, the bridge can be built of much greater length than heretofore, and also capable of sustaining a greater weight. Each of these truss braces is brought into place by a screw bolt and nut.—The bridge is suspended at the proper hight by a series of weights and chains, combined with a double-purchase fall. The inventor has applied for a patent.

Sawing Spoke Stuff.

Harvey Blanchard, of Dayton, O., has invented an improved mode of sawing stuff for spokes. The invention consists in sawing radial grooves of the same depth, as the required stuff in logs of various diameters, by means of a circular saw arranged directly under and in line with the axes of the log, which is hung on adjustable centers and set so as to have the saw cut to the required depth. It is fed to the saw by means of a reciprocating carriage. The inventor has applied for a patent.

Gas Stove.

Andrew Mayer of Phil. Pa., has invented an improved gas stove for warming apartments.—A jet of ordinary coal or other gas is thrown into a tube, the top of which, is funnel shaped and covered with an incombustible screen, which becomes strongly heated, and imparts its heat to the copper bottom of a tube in close proximity with it. The gaseous products of combustion are conducted away in a small pipe leading to the flue. Application has been made for a patent.

Operating Railroad Pumps.

Joel V. Strait, of Litchfield, Ohio, has invented a mode of supplying the water tanks on railways. It consists in placing inclined planes at the side of the rails, and in connecting them with a lever attached to the piston rod of a pump, so that the wheels passing over their inclines will depress them, thus operating the pump handle which will return to its place by a counterpoise attached to it. In this manner the cistern is supplied with water by the passing of the trains. The inventor has applied for a patent.

Improved Pencil Case.

J. H. Rauch, of N. Y. City, has applied for a patent upon an improved case for sliding pens and pencils. This invention consists in so forming the sliding tube that by a partial rotation in one direction, the slide will be made to operate upon the pen, while if it be made to resume the reverse position it will operate upon the pencil. By this means the pen or pencil can be extended at pleasure with an ease not before accomplished,—so the inventor avers. A patent has been applied for.

Street Pavement.

Daniel S. Darling, of Brooklyn, N. Y. has invented an improved mode of laying the foundation of street pavements. They are formed by imbedding a series of timber sills in the soil, so as to have their curved top surface even with the soil. Upon these are placed strong sectional floor timbers, which are placed close together edgewise, and made to follow the curved top surface of the sills. These timbers are then covered with cement, in which the flag stones are imbedded The inventor has made application for a patent.

(*Continued from the First Page.*)

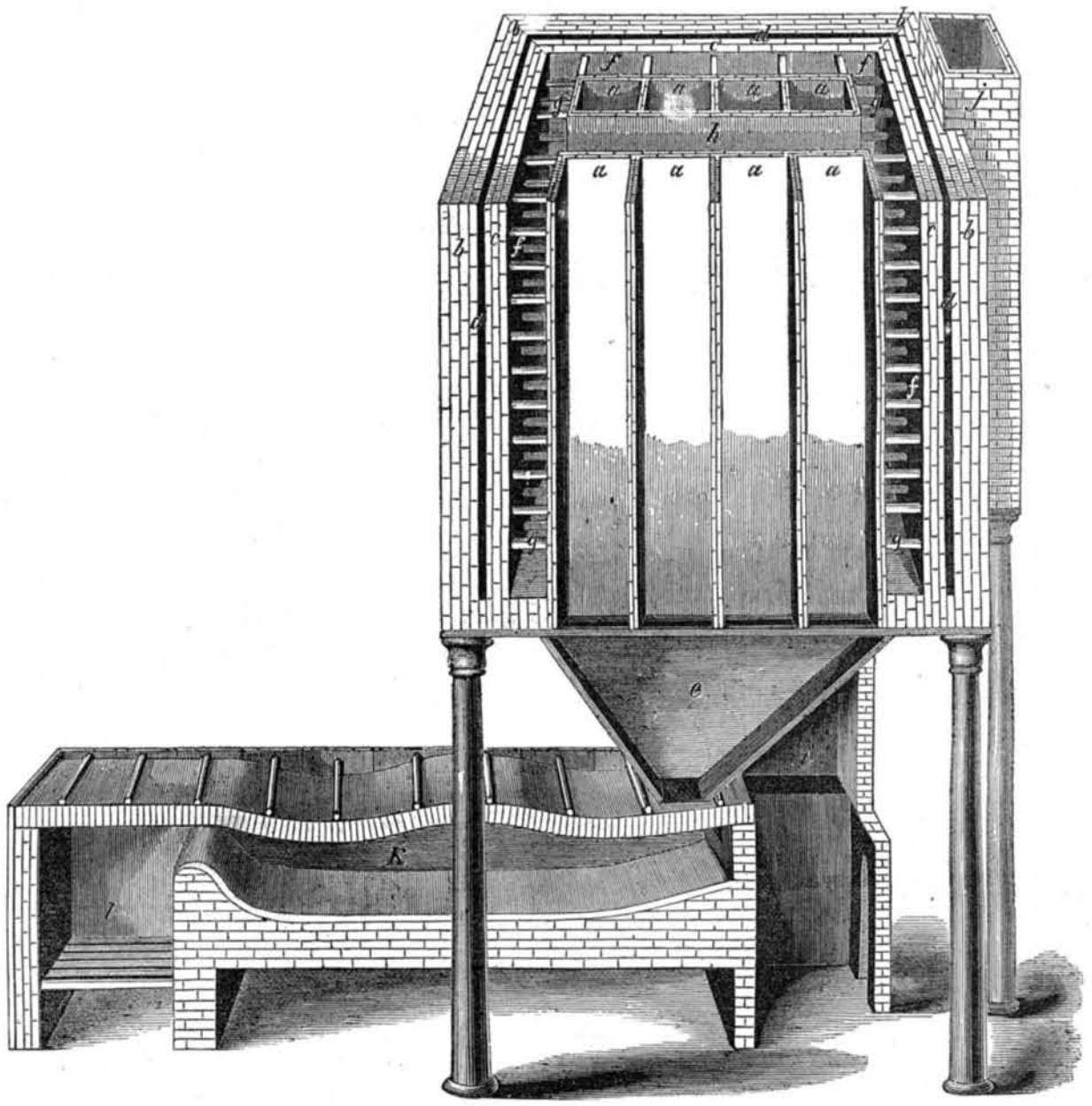
strong double wall of self-binding bricks, held together by the corner plates, *c c*, and the iron rods passing between them.

Our readers are very many of them aware that the process of making wrought-iron direct from the ore, is the oldest mode of manufacturing iron. Indeed it was the only one known among the ancients. In Persia this method is still employed, and it is fully described by travelers. But the simple process employed consisting merely of a heap of broken ore and powdered charcoal, would never answer for supplying iron in the quantities needed in civilized countries, and a modification of it, adapting it to the requirements of modern art, is what is accomplished in the process under consideration.

The proprietors of Renton's patent have also purchased that of Alex. Dickerson, and their joint claims embrace any mode of de-oxydizing the ore in a chamber, so constructed as to be heated by the waste heat, and at the same time prevent the products of combustion from coming directly in contact with the ore, and likewise permit the charge of de-oxydized ore to descend into the puddling chamber without exposure to the atmospheric air. The ore box or funnel-shaped chamber, *e*, is also covered by the claims.

This is one of the most important processes now before the public. We think it likely to effect a revolution in the mode of manufacturing iron. It seems certain that wrought-iron can, in this way, be manufactured 20 per cent. cheaper than by the old process, and we should be glad to see it adopted by our iron-masters generally. Any further information which may be desired, can be obtained by addressing The American Iron Co., 107 Market street, Newark, N. J., or by application personally to A. H. Brown, at that place.

Figure 2.



Substitute for Pen and Ink.

Since we published the remarks, a few weeks ago, respecting the benefits that would be conferred upon the writing community, by the invention of a *jet black pencil*, to supersede pen and ink, we have received a number of letters about *fountain* pens, but we do not wish to have anything to do with these—their advantages and disadvantages being well known to us; —the pencil and nothing but the pencil is the watchword and reply for us.

American Plate Glass.

The experiment of making plate glass at Cheshire, Berkshire Co. Mass., is said to be quite successful. The proprietors of the glass works at Lenox are making experiments with the sand taken from the top of Washington Mountain, in the same county.

Street Indicators.

An excellent proposition has been made in Philadelphia to remedy the present defects in the form of street indicators, by painting the names of the streets upon the glass of the gas lamps, one of which is now to be found in every street corner in that city.

It has been discovered that feathers unskillfully cured and put into beds, are deadly to persons of weak lungs sleeping upon them.

Carey's Pump.—Erratum.

In our notices of the medals which had been awarded by the committees of the Crystal Pallace, it was stated that one had been granted to A. C. Carey of N. Y. City; it should have read A. W. Carey, of Brockport Monroe Co., N. Y

Crystal Palace Awards.

The sounds of discontent come muttering from East, West, North and South, respecting the awards of Prizes in the Crystal Palace. We do not wonder at this, for many of those Prizes were neither awarded with discretion nor impartiality.

Sizes of Books.

When the sheet of paper of which a book is made is folded in two leaves the book is called a folio; when folded into four leaves it is called quarto; when folded into eight leaves it is called octavo; when folded into ten leaves, a duodecimo, or 12mo; when folded into sixteen leaves, a 16mo; when folded into eighteen leaves, 18mo, etc.

There were 233,000 barrels of ale manufactured in Albany last year. 600,000 lbs. of hops are used, worth 35 cents per pound. The number of persons there employed is about 700.

American Coal.

In a recent outline of the Geology of the Globe, by Hitchcock, the accomplished geologist, some interesting facts are given respecting the extent and inexhaustibility of the coal measures of the globe, particularly those of the United States. In Nova Scotia and New Brunswick the coal field covers nearly ten thousand square miles. In the southeast part of Massachusetts, and in Rhode Island, is a deposit covering nearly five hundred square miles. The great Apalachian coal field, extending from New York to Alabama, is seven hundred and twenty miles in length, and covers nearly 100,000 square miles. The Indiana coal field, three hundred and fifty miles long, embraces about fifty thousand square miles. In Michigan is another, one hundred and fifty miles long, which covers twelve thousand square miles.—The Missouri and Iowa coal fields, embrace fifty thousand square miles. The grand total in the United States amounts to more than two hundred and twenty-five thousand square miles.—When we think of the immense extent to which the use of steam will hereafter be increased on this continent, in consequence of the use of coal, we can form no adequate conception of the future populousness and prosperity of the country.

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Scientific American.

NEW YORK, FEBRUARY 11, 1854.

Our Planet before and after the Flood—Its Poles Changed.

A correspondent in Ohio asks our opinion respecting a change in the position of the poles of our planet during some period of its history—such as at the general Deluge. We will endeavor to present some peculiar information in support of such a change, as deduced from sacred history and scientific discovery.

The "Nebular Hypothesis" assumes that the materials of which our planet is composed were once in a state of gas or nebulæ; thus agreeing with the history of our earth as given by Moses, that there was a time when our planet was *not* as it now is, and as it is forcibly expressed by St. Paul, "the Worlds were framed by the word of God, so that things which are seen were not made of things which do appear." The account of the creation of our world as given by Moses, tells us, that the Earth was prepared—like a ready furnished mansion, for man, before he was introduced into it. Geology confirms this statement—it stands out as a positive fact in Science, as well as revelation, only the majority of geologists, seem to entertain the opinion that our planet was countless ages in preparation for man's reception, not six solar days, as stated by Moses. But the account given by Moses may admit of a construction, which can explain much that is contended for by geologists. Our planet may have been in a state of desolation, when the command went forth "Let there be light," and the six days works of creation, no doubt describes, what was done, to fill the earth with order, plenty, and beauty, as it was before the flood. Our planet may have undergone many changes, and it may have been the abode of strange creatures, previous to its present sacred history, and some great convulsion or convulsions, may have destroyed all life, order, and beauty in it, and it may have so remained for a number of ages, previous to the period, when the Mosaic account of our planet commences.

The crust of our earth presents many evidences of great and sudden convulsions, and two periods of such actions are recorded by Moses; one when the seas, were gathered together into their mighty basins, and the other at the Deluge, when "the fountains of the great deep were broken up;" thus showing that scripture and geology are agreed in some very important particulars, and as Moses was no geologist, it is not a little surprising that he should furnish a key to unlock some of the mysteries of geology.

Many peculiar changes, must have taken place on our planet before the Deluge. Sacred history describes a condition of things very different from that which now exists. Thomas Burnet author of a curious history of the earth put forth the theory two centuries since, of a change in the position of the poles of our planet at the flood. He attributes this change of position to a comet striking our earth as a chosen messenger of God. Previous to that event, he asserts that the axis of our planet was in the plane of the ecliptic (Jupiter's is nearly so) consequently there existed over its whole surface, a constant warm climate, except immediately around its poles. This theory seems to accord with geological discoveries which have been made since Burnet's day, and is confirmed by sacred history. The remains of such animals as now live only in tropical countries are often found in Siberia; and the skeletons of elephants are not unfrequently exhumed from beneath the streets of London, not over twenty feet under the surface of the ground. The skulls, teeth, and other remains of hyenas and such tropical animals are abundant in some of the British caves, thus showing that Britain at one period enjoyed a far warmer climate than it now possesses. These things can be explained by supposing the poles of our planet to have been changed according to the theory of Burnet. In the 38th chap. of Job, it is said "hast thou caused the day-spring to know its place, that it might take hold of the ends of the earth (for ends read *poles*) that the wicked might be shaken out of it? It is turned as clay to the seal, and they stand as a garment, from the wicked their light is holden. Hast thou entered into the treasures of the snow: the waters are hid as with a stone, and the face of the deep [ocean] is frozen?" This is strange language about taking away the light from the people dwelling at the poles, and about the freezing of the sea. The people of Palestine never see frost, except on the heights of Lebanon, and the author of the Book of Job—as a man—certainly knew nothing personally about the freezing of the sea. In Gen. 8th chap. and 22nd verse it says, "While the earth remaineth, seed time and harvest, cold and heat, summer and winter shall not cease." This is a promise that certain things were to continue to exist in the future, and the plain inference is, they did not so exist in the past. It is owing to the inclination of the poles of our planet, that we experience the vicissitudes of the seasons. In reference to this and the language of Scripture which we have quoted, the astronomer Hind, who has discovered so many of the asteroids, says—"the inclination of the poles of our earth amounts at present to 23° 27′ but is subject to a very slow diminution not exceeding 48″ in 100 years. It will not, however, be always on the decrease, for before it can have altered 1° 30′, the cause which produces this diminution must act in the contrary direction, and thus tend to increase the obliquity. But this change of obliquity can never become sufficiently great to produce any sensible variation of climate on the earth's surface. This perturbation of obliquity will never become very great or very small, and explains how effectually the Great Creator has ordained the means of carrying out his promise to Noah, though the way it was to be accomplished remained a hidden secret until the discoveries of modern science placed it within human comprehension." The Bible and Science, we therefore see, harmonize respecting a change at one period, in the position of the poles of our planet; and they also harmonize respecting other great changes, which have taken place in its interior and on its surface.

The Ericsson Again.

To the Editor of the Commercial Advertiser.

Your notice of the approaching trial trip of the caloric ship suggests that such a delay has occurred in the matter as is a subject for complaint. Apart from the fact that the enterprise is altogether of a private character, allow me respectfully to remind you that while the steam engine is the work of two generations of engineers, and its perfection the result of several thousand repetitions, the caloric engine, which you appear to think has required too much time for completion, is only the second of its kind. Nor is this engine a model. It is constructed on a scale of the first magnitude. Considering, then, that I am endeavoring to attain at one stride a result more important than that which has kept the engineering world busy for half a century, you will, I am sure, on reflection, not press your call on me for an immediate "termination of all suspense" in relation to the caloric ship.

I am respectfully,

J. ERICSSON.

NEW-YORK, Jan. 25, 1854.

[The above is another letter of Capt. Ericsson, addressed to one of our daily papers, and we are sorry that he ever sent such an epistle for publication. The impression that would naturally be conveyed to the mind of those unacquainted with the history of Hot-Air Engines is erroneous.

The *enterprise* is not altogether of a private character. No one has endeavored to give it more of a public character than Capt. Ericsson himself. He has lectured upon his Hot Air Engine from diagrams and models, and others have also lectured publicly on the subject, no doubt at the solicitation of those interested in the "Ericsson." What is the enterprise? The substitution of hot air engines for steam engines to propel ships. It is not the copartnership of the owners of the Ericsson, the ship itself, or Capt. Ericsson, but his public effort to supersede the steam engine. A letter dated Jan. 6, 1853, from G. B. Lamar, who is stated to be one of the owners of the Ericsson was published in the Savannah "Republican," which contains the following statements—"It [the Ericsson] can be relied on for ten miles an hour on a first experiment, (a fact, when we remember that steam made at first only four miles an hour), which places the new invention on an impregnable basis." "I consider Capt. Ericsson's fame beyond Fulton's." "The 'Ericsson' would go to Japan and back a dozen times for less than one of the U. S. steamers would cost, and be ready for any other service as long as her hull will last—this, too, without expending any time whatever to *repair* her engine." "Congress ought to buy Capt. Ericsson's patent and throw it open to the public."

This enterprise is just so much a public affair that Capt. Ericsson, through his counsel, proposed to the late Secretary of the Navy, Hon. J. P. Kennedy, to build two frigates with hot-air engines, to be propelled at the rate of 10 miles per hour, and the Secretary commended to Congress the "immediate adoption of *the great* invention for the use of the Navy, and the passage of a resolution to direct him forthwith to make a contract with Capt. Ericsson for the construction of one Ericsson frigate of not less than 2000 tons, and to appropriate $500,000 for this purpose."

And yet Capt. Ericsson calls it altogether a *private* enterprise, and this even after the invitation given to part of the corps of the New York Press to attend on the trial trip, where they made themselves so ridiculous. Capt. Ericsson is now certainly indulging a good joke at their expense, considering their present silence and their former laudations about the wonderful success of the "Ericsson." They certainly take it very placidly to be now snubbed up by Capt. Ericsson for daring to call on him for an "immediate termination of suspense in relation to the Caloric Ship."

A false impression is conveyed in the above letter, respecting the steam engine and the hot air engine. The present steam engine is not the work of two generations of engineers and many thousand experiments; nor is it true that the hot-air engines of the "Ericsson" are the second *hot* air engines ever made (the impression naturally conveyed, although Ericsson adds, of its "*kind*.") The steam engine of the present day is not different in principle from the one built by James Watt for the "Clermont," the first successful American steamboat. In detail it is—but every essential principle was embraced in that engine, and from the first it was successful. Watt's patent expired in 1800 and in 1827 the brothers Stirling took out their patent for a hot-air engine, so that it is now exactly twenty seven years since the hot-air engine was first invented. Has it attained to the same perfection of the steam engine of 1800 since 1827, when in the former year there were only four steam engines on the whole continent of America? No, and yet Capt. Ericsson is indebted to steam engineers for nearly all the essential features in his hot-air engine and no credit given to them—no, not one word, but he leaves the public to infer, by passing over everything which has been done for him by steam engineers for fifty years past, and making no allusion to the Stirlings, that he is working out something entirely new, which will bury the labors of the Watts, Fultons, Stevensons, Napiers, and all other eminent engineers, at home and abroad, in oblivion. Such modesty is rather too strong for us.

Preserving Fruits and Meats.

A correspondent solicits a receipt for preserving fruits, meats, and vegetables, by the exclusion of air from them.

There is more than one method of preserving such substances. The patented plan of Gail Borden, Jr., for combining the extract of flesh meat with some flour, in a biscuit, cannot be surpassed for various purposes. Another plan is to heat meats contained in tin canisters, in a kettle containing a solution of the chloride of calcium. The meat is put up in each canister, and all soldered tight, excepting a very small hole on the top. When the solution is heated up to 212°, the water which is combined with the meat begins to pass off out of the small orifice in a state of steam. When this is continued for a short time (about five minutes) a person who stands ready with a soldering iron and a cloth, catches a canister, passes the cloth over the orifice, drops a piece of melted solder on the hole, and applies a piece of ice at the same time to lower the temperature of the vessel. This is the mode of hermetically sealing "meat canisters."

The chloride of calcium does not boil until it attains to 302°, while water boils at 212°, so that while the steam is passing off from the meats, the calcium solution is still 90° below the boiling point.

Fruits are preserved by charging bottles containing them, with carbonic acid gas, to expel all the air, then sealing them up with air-tight covers. By simply boiling in water, fruits and meats contained in glass vessels, for about twenty minutes, then corking them up tight while the steam is passing off—covering the cork with a luting of pitch or wax, and then cooling the vessels quickly below the boiling point, meats and fruits so treated, are said to keep well for a year. The vessels should be made of annealed glass, otherwise they are liable to break during the operation.

The Great Telegraph Case.

On the 30th ult., Chief Justice Taney delivered the decision of the U. S. Supreme Court, in Washington, in the great Telegraph Case, of Morse vs. O'Reilly, which has been for several years past before the Court. The case was brought up, from the Circuit Court of the District of Kentucky, wherein Prof. Morse was granted an injunction against Mr. O'Reilly, for using an electro-magnetic telegraph, styled the Columbian Telegraph, constructed by Messrs. Zook & Barnes. The suit was commenced in Kentucky, in the summer of 1848. The Supreme Court decided in favor of perpetuating the injunction granted in Kentucky against O'Reilly, and makes each party defray their own costs.

The Court sustains the first seven claims of the patent granted to Morse, and all the claims in the second patent, we believe, are also sustained without qualifications. The eighth claim of the first patent the Court decided ought to be disclaimed.

The reports which have appeared in our Daily Papers, respecting this decision, are contradictory, and as a true copy of that decision has not yet reached us, we postpone further remarks on the question, excepting to say, that, from public and private information received by us the decision confirms the very doctrines we have always advocated.

Rules of the Patent Office Relating to Foreign Patents.

For an American patent, when an applicant seeks to make his case a preferred one, in consequence of having received a foreign patent, he should temporarily file the patent he has obtained in the Patent Office with a specification (provisional or complete) attached, or file a sworn copy of these. But when such papers—or copies of them—cannot be conveniently furnished, it will be sufficient, if the reasons of such inability be set forth by affidavit, specifying the fact, that a foreign patent has actually been obtained, (giving the date), and showing clearly that the invention so patented covers the whole ground of his present application.

Bank Notes—A New Discovery Wanted.

On our advertisement page will be found the offer of a reward of $500 for a new and useful discovery to prevent the alteration of Bank Notes. The advertisement is longer than any we are in the habit of admitting, according to a general rule, but it is one of so much importance to the public that we could not but admit it freely and recommend it strenuously to the attention of chemists and others.

In a letter received by us a few days since, from R. C. Bristol, the inventor of the rotary engine, illustrated by us in No. 9 of the present volume, he informs us that he is putting an engine constructed upon his plan in a steamer of 200 tons burden, at Ohio City, O. This will give the inventor an opportunity to test thoroughly the efficiency of his engine.

It is said that one of the most distinguished physicians of New England ascribes the fearful increase in cases of paralysis to the use of stoves in close rooms particularly in sleeping apartments.

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Recent Foreign Inventions.

Wood Screw Treenails—William Hall, of Aberdeen, Scotland, patentee. This patent is simply for the employment of wood-screw treenails for shipbuilding purposes, as substitutes for the common round, square, or octagon wood treenails, now used.

Miner's Fusees—M. Davy, England, patentee. The inventor proposes covering these fusees with a substance which shall be an efficient protection against moisture. The fusee being made, it is placed within a tunnel, and passes out from its top, which is pierced with a small hole. This tube is then filled with a liquid of the following composition :—1 part resin, 1 part Burgundy pitch, 4 parts gutta percha. This mixture is placed in a furnace heated by steam; this steam, conducted by a tube, serves also to heat the conical reservoir in which the liquid has been turned. The fusee is rolled upon a large bobbin, and by means of a crank it is unrolled and made to pass in the tunnel; in quitting this it is passed over a pulley plunged in a vessel of cold water, and is rolled upon another pulley which is above the water.

Drying Grass—Henry Saunders, of Staines, Eng., patentee. This invention consists in causing grass, corn, and other crops, to be artificially dried by their being carried immediately after being cut, to a drying apparatus, which consists of an enclosed chamber, into and through which warm dry air is forced to evaporate the moisture, and cure the grass or other crop. This is exactly the plan we recommended a few weeks ago, when commenting on the remarks of the "Tribune," on the curing of hay by steam. We knew nothing of this patent being granted when our remarks were penned.

Wooden Cards for Jacquard Looms—C. Charles, of London, patentee. This invention consists in substituting thin sheets of poplar, pine, or other similar soft woods, free from knots, in place of pasteboard cards. The material is cut from blocks into very thin sheets, then dipped in a weak solution of glue, and placed in a press. After being in the press for about an hour, they are taken out, immersed in a glue solution again, and then passed between rollers. A sheet of paper is then laid on each side of a slice of wood, and a number of pieces thus treated are laid upon the top of one another and placed in a press until they are nearly dry. They are then taken out and exposed to the air, after which they are ready to be punched like common cards according to the pattern required.

Refining Sugar—R. Galloway, of Cartwell, England, patentee. This improvement in the manufacture of sugar consists in employing tannic or gallic acid, or a compound of both, combined with potash or ammonia, in conjunction with the acetates of lead, which are now used in refining sugar.

Artificial Stone—G. Juste, of Paris, patentee. This invention consists in manufacturing stones from all kinds of sand, and metallic ore. The inventor first submits these materials to the action of strong heat in an oven, and when they are at the point of red heat, they are taken out and reduced to powder in a large mortar, by stamping. The substances thus reduced are then mixed with some fluxes for easy fusion, such as boracic acid, oxyd of lead, and lead and soda. They are then melted in an oven, from whence they are taken out and thrown into a vessel containing cold water. After this these matters are again triturated and reduced to an impalpable powder, and after being pressed into moulds of fire-clay, are placed in a potter's oven, where they are submitted to a great heat. After this they are withdrawn and found to be moulded into blocks according to the form of the moulds. The moulds may be of any pattern, ornamented or merely useful.

[Collated from our foreign cotemporaries, the "Mechanics' Magazine," "Newton's Journal," "Artisan," and "Mining Journal," London; "Genie Industriel,' "L'Invention," and "La Lumiere," Paris, and the "Glasgow Mechanics' Journal.]

They are about introducing the American railroad car into England. It is admitted to be, in every respect, superior to the car now in common use on the English railways.

To Detect Cotton in Woolen or Silk Fabrics.

The following is from the writings of Dr. Pohl, a German Chemist:

The author employs a solution of picric acid in water of alchohol for the distinction of vegetable from animal fibre. The original watery solution is diluted with 6 parts, the alcoholic with 16–20 of water; a small piece of the stuff to be examined is then dipped in the solution. In from six to ten minutes of ordinary temperatures, or in two or three minutes when the fluid is heated to 105°F., the stuff of yarn is taken out and washed with water. Stuffs made entirely of cotton or linen appear perfectly white after washing; but those consisting of wool, or silk, or other animal fibres, acquire a yellow colour, it being understood that undyed stuffs are to be used in the experiment. In mixed stuffs the animal fibres appear coloured, whilst the vegetable fibres remain white. The test is so exact, that even in those stuffs or yarns in which the individual threads consist of both substances, the proportion of animal and vegetable fibre can be exactly ascertained by means of a lens. By the employment of an ordinary thread-counter, the number of vegetable and animal fibres in these mixed fabrics may be ascertained with sufficient exactness.

This test may also be employed with most dyed stuffs; at least it may be applied to orange, red, fawn color, rusty yellow, violet, every kind of blue, and some browns. Thus, as the mordants usually employed, as alumina and salts of tin, and lead and iron compounds, do not produce any essential change in the yellow color of picric acid, but only deepen it more or less, stuffs dyed with the above-named colours undergo no remarkable change by being dipped in the test-solution, if they consist of vegetable fibre; but a change always takes place when animal fibre is present, and this will always indicate with perfect certainty whether a stuff consist of animal or vegetable fibre or of a mixture of both. Thus wool dyed red becomes changed by picric acid into orange-red or orange according to the shade of the original color, whilst rusty yellow becomes bright yellow, blue colors green, and green grenish-yellow.

[It is very easy to tell whether cloth is made with a cotton warp, (such fabrics are now very common and liable to deceive the uninitated) and a worsted or silk weft, by simply pulling out some of the weft threads at the end of the piece, and applying the light of a match to the warp. If the latter is made of cotton, it will burn with a flame, if woolen or silk, it will burn or singe away, without flame. There is a great amount of cheap textile fabrics manufactured at the present day, and sold with the assurance that they are wholly composed of wool or silk, which have considerable cotton mixed with them in the carding process. Of course, the method for detecting such base fabrics must be subtle, and that recommended by Dr. Pohl, may be very excellent. Those who purchase goods at retail, in stores, however, have no appliances, and no disposition to try such experiments; to them it is of little value. The simple test we have given is of more value to the retail purchasers, for it can be practised by all at no expence whatever.

The Monument of Galileo at Florence.

The following interesting extract is taken from Prof. Silliman's visit to Europe:—"The noble monumental memorial of Tuscany's greatest philosopher is, however, the central point of attraction in the Museum for the lover of science. It is the most complete, appropriate, and interesting personal commemoration which we saw in Europe. Two large apartments, in the most perfect style of Roman architecture, have been consecrated to the greatest genius of Tuscan science. They are joined by connecting arches, forming a rich atrium in the style of Bramante, the antes, pilasters and flour being encrusted with polished marbles and hard stones, all the produce of Tuscany. At the farthest end stands a noble full-sized statue of Galileo, designed by Asioli, and sculptured by Costoli, Florentine artists. This statue is in full drapery, gathered by the left hand into rich folds, while the right rests upon a pedestal carved with the diagrams, containing some of his celebrated propositions. The ceilings are domes, and richly decorated with panels, in which beautifully designed frescoes, in vivid colours, commemorate the noble discoveries of Galileo, and of the other Tuscan philosophers. In one, Leonardo da Vanci communicates before the Duke, and an assembly of admiring listeners, the state of mechanical science in the early part of the sixteenth century. This is the most classic and elegant of all the compositions in fresco contained in the apartment. Others illustrate the first experiment of Galileo on the law of falling bodies, the discovery of the measurement of time from the oscillation of the pendulum, the invention of the telescope, and other subjects commemorative of the discoveries of the Florentine academician. Busts of many of the more celebrated of these rest on pedestals surrounding the inner room, medallions, in bas-reliefs, of other philosophers and poets fill the spaces under the cornice. In hexagon spaces between the groinings of the arches are allegorical figures of Nature, Truth, Perseverance, and Physical Science, while corresponding spaces are filled up by medallions of Philosophy, Astronomy, Geometry, Mathematics, and Mechanics.—All these are graceful, dignified female figures, seated and surrounded by appropriate emblems. One of the frescoes in the anterior rooms represents Volta demonstrating the immortal experiment of his pile before the French Academy at Paris in 1801. Napoleon, as a member of the institute, views with the most interested attention this novel experiment. Monge, Berthollet, and Vanquelin surrounded him. Fonuroy looks on with wondering delight, while La Place, Lacepode, Cuvier, Legendre, Morveau, and Biot are recognised amongst the crowd of illustrious spectators. Tuscany had good occasion to be proud of her great names in art, science, and literature; and all who visit this delightful temple of Galileo must feel that the present Grand Duke is deserving of praise for his monument, however we may regret his espousal of principles since the revolution of 1848, so hostile to the best interests of his people.

The Air Pump of the San Francisco.

Messrs. Editors—There seems to be a great deal of discussion as to what was the cause of the mishap to the steamer "San Francisco." I call it mishap, because it cannot be called an accident. Had her engines been built the same as those of the steamers "Illinois" or "Golden Gate," as many of the papers stated, she would not have met with the mishap. The "San Francisco" used oscillating engines, but the air-pump, the immediate cause of the disaster, was driven by a separate engine, and was built for one of Pirrson's condensers, which failed to do its work, and one of common construction was put in its place, which of course was of much greater capacity. Hence the cause of the disaster was, that the air-pump was not half large enough to free the engines, and particularly in the gale when they were driven to their utmost capacity. Any one at all acquainted with machinery will see the absurdity of driving the air-pump of a steamer by a separate engine. They had great difficulty with that same air-pump on her trial trip.

Another thing which tended greatly to the mishap, was that she was loaded much beyond her capacity, with coal, provisions, &c., and she was much worse off when her upper works were carried away. J. Newton, Jr.

New York, Feb. 2, 1854.

Rather Alarming.

The Spiritual Telegraph has an article headed—"Lock Picked by Spirits!"—to which the "Boston Investigator" responds, that "there is too much of this business carried on by sinners in the flesh, without having any additional help from the spirit world; but we would rather see a spirit pick a lock than to read about it. By the way, since the spirits are said to possess a great amount of physical power, why don't they do something useful with it? Tipping up a table or knocking on a wall don't do anybody any good. Let them manage the brakes of an engine when a house is on fire, or stop an omnibus when it runs away with a load of passengers, or drag the boys out of the ice when they fall in while skating and thus save them from drowning, and they will then make themselves useful and greatly increase the number of their believers. We have had enough of tappings and rappings—now let's have semething from the spirits that will be of practical benefit to their brethren in the flesh."

Our Prize Awards.

Messrs. Munn & Co.—I have this day drawn upon you for the Prize awarded me for the list of subscribers sent you for the "Scientific American." I am sorry that my business would not permit me to devote more time to extend the list. It is a pleasure for me to canvas for your very valuable paper, and I attribute my success to its sterling character more than any other cause. The first prize was unexpected, therefore the more gratifying to me. You will please accept my thanks for the promptness of the information of my success. I have received applications to canvass for other works, which I respectfully decline. Yours, &c.,

J. N. Scofield.

Columbia, S. C., Jan. 27, 1854.

Messrs. Munn & Co.—Yours contalning $20 is received. All right. Thank you, gentlemen for the liberal course you have pursued. If I remain here, which is doubtful at present I shall endeavor to extend the circulation of your paper to one hundred subscribers to the next volume; and if I leave this place I will with pleasure do all I can wherever I go, to put the "Scientific American" (as it should be) into the hands of every mechanic.

John Garst.

Dayton, Ohio, Jan. 31, 1854.

[The awards of our Prizes, so far as we can judge, seem to have given satisfaction to all parties. The successful competitors say that no great amount of labor was necessary for obtaining their lists.

Supreme Court of the United States.

We are indebted to William Whiting, Esq., of Boston, Mass., for a copy of his argument delivered in the U. S. Supreme Court, in the case of Brooks et al. versus Fiske & Norcross. It will be remembered by many of our readers that Judge Sprague, of the Circuit Court, delivered an opinion in favor of Norcross, and adverse to the claims of the Woodworth assignee. The present argument was delivered in behalf of defendants, on the appeal taken by the plaintiffs, and for searching power of analysis and cogency of reasoning, it is a masterpiece. Mr. Whiting shows up the claims of the Woodworth machine very clearly, sufficiently so to satisfy any reasonable man that the Norcross machine is no infringement.

A New Clock.

Among the late inventions announced is a curious one by Mr. Robert M. Kerrison, of Philadelphia. It is a clock, different from any heretofore made, in being without the slightest noise or any alteration in its motion, and, from this latter fact, promises to be the greatest use in the science of astronomy. In this clock Mr. Kerrison has succeeded in overcoming a difficulty which has been made the study of scientific mechanics for nearly two centuries, being attempted by Huygens as early as 1768.—[Exchange.

[This is rather a profound description of this wonderful clock.

Names of Sizes of Printing-Paper.

Formerly such names as Flatcap, Demy, Medium, Royal, Super-royal, Elephant, Double Medium, Mammoth, were used to designate regular sizes of printing-paper; bnt at present such paper is designated chiefly by inches, as 25 by 28, etc. Only a few of these names are now much used to denote a standard or particular size of paper; these are, Flatcap, 14 by 17 inches; Medium, 19 by 24 inches; and Double Medium, 24 by 38 inches. Printing-paper is bought and sold by the pound, the price varying according to quality, from ten cents to sixteen cents, for the paper commonly used for such purposes.

Long Hair.

Sir C. Wilkins states, that while he was a resident at Benares, he saw a fakir, the hair of whose head reached the enormous length of twelve feet. The tails hair of the Chinese frequently reach the ground! and their moustaches have been cultivated to the length of eight or nine inches.

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TO CORRESPONDENTS.

G. G., of Mass.—A balance-wheel will be of no service to you whatever.

F. R. B., of N. Y.—We are well aware of the facts relative to obtaining the full power of the water. We do not know that we rightly understand your last question; how can each end of the partition of your tube, as you state, form an axis? If you use a spiral tube with two arms, it is the same as Whitelaw and Stirratt's wheels.

C. H. J., of S. C.—Large stoves, with drums to expose a great amount of radiating surface, are the best heaters when wood is used for fuel. Neither steam nor hot water will answer your purpose. Perhaps you would like to try a general "heater," in your basement for the purpose of heating with hot-air, this may answer very well in your climate. We have handed your letter to another party as requested.

R. McC., of N. Y.—Your steam engine should be about 10 horse-power, with 50 lbs. pressure on the square inch of piston. There is no positive rule for the horse-power of an engine now, that is, as it respects its dimensions.

T. F., of Mass.—The best mode of preserving hams is to rub them well with the best quality of salt every day for a week, and also rub in some ground pepper and cloves before you hang them up.

J. S., Jr., of Phila.—We cannot furnish the information sought about the furnace of Chance, but we can about Howell's. The coal was used in the latter furnace in conjunction with a blast, the furnace being lined with fire-brick. Howell was a native of Philadelphia.

M. F., of Ind.—By the employment of your two wheels, an over and undershot you lose one half of the effect from the hight when the water is discharged from the overshot. One large overshot wheel is far better than your two; it requires just as much power to pump up the water as the effect obtained from it. Your plan is not a good one, we can assure you.

L. L. W., of Mass.—A patent can be obtained for a useful composition alone.

R. B. B., of Mo.—The extract to which you refer was taken from a foreign paper, and we have heard nothing more about it since.

C. B. K., of Ill.—As the pressure of steam increases, so does its temperature. For tables of this increase and rate of expansion, consult any good work on steam and steam engines. The temperature will be increased by heating the steam apart from the water.

S. G. C., of Pa.—We do not discover the slightest novelty in your device for feeding water to boilers without the aid of the force pump. We have seen essentially the same thing before.

Wm. Wood of Columbia, Tenn., wants a first-rate machine for turning spokes. Some manufacturer will please communicate with Mr. Wood.

Oran Cole, of Detroit, Mich., wishes to purchase a machine capable of turning axe and hammer handles. Mr. Cole will be "the humble servant of any one who will furnish him with the information."

H. S., of Va.—You can dissolve shellac in a strong solution of soda or pearl ash, but we prefer alcohol. The varnish thus made is useful for many purposes.

E. H., Jr., of Ala.—We are not acquainted with Mr. A. You can obtain the oxyd of gold by following the direction on another page.

M. R., of Me.—We are fearful that your brake would not possess sufficient power to stop the speed of the train as soon as required. As auxiliary to a steam brake upon the locomotive (a cumbrous expedient) it might, however, be useful. We should think it possessed sufficient novelty to warrant an application if its utility were determined.

W. A. P., of Miss.—There never has been any difficulty in making the paddles dip and lift vertically: your plan, however, is new to us. We have never known of the steam being used directly, as is set forth in your description. We do not like your plan, as the radial paddle-wheel is far better than any other kind.

Money received on account of Patent Office business for the week ending Saturday, Feb. 4:—

P. S., of Ct., $55; D. B. H., of S. C., $20; A. J., of Ind., 30: J. A. S., of N. Y., $100; G. H., of R. I., $30: W. H. H., of O., $25; P. W., of Mass., $30; J. S. S., of Md., $30: W. H. A., of N, Y., $55; J. C., of N. J., $30: C. W., of Conn. $25; T. R., of N. J., $12: S. B. C., of Pa., $55; S. M., of N. Y., $15; J. C., of N. Y., $30; J. W., of Mass., $30; R. P. B., of N. Y., $30; J. M. N., of Vt., $30; G. S., of N. Y., $30: A. E., of N. Y., $35; H. T., of N. Y., $12, W. H. S., of N. Y., $20.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Feb. 4:—

W. H. S., of N. Y.; T. B. S., of N. J.; T. R., of N. J.; C. W., of Ct.; J. H., of N. Y.: W. H. H., of Ohio; H. T., of N. Y.; A. E., of N. Y.; G. S., of N. Y.; L. C. C., of Ct.

A Chapter of Suggestions, &c

PATENT LAWS—The seventh edition of the American Patent Laws and Guide to the Patent Office, published by us, having been exhausted, we shall not be able to furnish orders under ten days or two weeks. Those who have remitted money for copies will be supplied immediately on the issuing of a new edition.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

PATENTEES—Remember we are always willing to execute and publish engravings of your inventions, providing they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engravings executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

TO CORRESPONDENTS.—Condense your ideas into as brief space as possible, and write them out legibly, always remembering to add your name to the communication, anonymous letters receive no attention at this office. If you have questions to ask, do it in as few words as possible, and if you have some invention to describe come right to the business at the commencement of your letter, and not fill up the best part of your sheet in making apologies for having the presumption to address us. We are always willing to impart information if we have the kind solicited.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement: Of Vols. 1, 2, 3, and 4—none. Of Vol. 5, all but six numbers, price, in sheets, $1; bound, $1,75. Of Vol. 6, all; price in sheets, $2; bound, $2,75. Of Vol. 7, all; price, in sheets, $2; bound, $2,75. Of Vol. 8, none comple, but about 30 numbers in sheets, which will be sold at 50 cents per set; of Vol. 9, none previous to Jan. 1st, 1854.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post-office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post-office at which they wish to receive their paper, and the State in which the post-office is located.

RECEIPTS—When money is paid at the office for subscriptions, a receipt for it will always be given, but when subscribers remit their money by mail, they may consider the arrival of the first paper a bonafide acknowledgment of the receipt of their funds.

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American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express, or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

$500 REWARD—For an Invention to Prevent the Alteration of Bank Notes. To Chemists and others. In order to prevent the loss and annoyance occasioned by the ALTERATION of Bank Notes either by changing the name of the Bank, or the denomination of the Bill, as practiced by counterfeiters, and to procure an effectual barrier to such practices, by encouraging the invention of materials, such as ink and paper, of a nature to afford in either or in any combination of them, the desired protection—the Executive Committee of the Association of Banks for the Suppression of Counterfeiting, will pay the sum of Five Hundred Dollars to any person who shall invent the best mode, in the opinion of the Committee, of accomplishing the object named. All plans to be submitted to the undersigned on or before the 25th day of March next, and to be accompanied with such explanations of the materials and processes as the party applying may be willing to disclose. Each applicant to lodge with the Treasurer of the Association, Henry M. Holbrook, Esq., for the term of three months, the sum of one hundred dollars, which shall be paid to any person who shall, during that time, alter, by removing and printing anew, any material portion of a bill or note prepared in accordance with the plan submitted, in such a manner that the alteration would, in the judgment of the Committee, be likely to pass unsuspected. And if, at the end of said three months, no one has been able to effect such alteration, and the Committee are satisfied that the materials proposed will stand all the tests which the present knowledge of chemistry affords, then the hundred dollars will be returned, and the reward paid over to the successful applicant, and the hundred dollars deposited by each of the other applicants to be returned to them respectively. Per order of the Executive Committee,

J. M. GORDON, Secretary.
Columbian Bank, Boston, Mass., Jan 24, 1854. 22 7

THIS IS TO CERTIFY that I have had in use one of Parson's Self-straining and Self-ranging Saw Frames, during the last year, and find the same to be an improvement upon the old fashioned Saw Gate; my mill had two English Gates. Wheels entirely similar and geared precisely in the same manner, the only difference being that the water gate to one of the mills vented about 500 inches, and the other about 400 inches, the consequence was that the mill venting most water did a proportionably larger amount of work. The gate venting the least was changed for one of E. H. & S. E. Parson's saw frames; the result was highly satisfactory—the mill containing said frame cutting about one-third more lumber than the English Gate, with the larger amount of water. EDWARD J. FARNHAM.

Wellsville, Alleghany Co., N. Y.

The above certificate refers to the saw mill referred to on page 54, present volume Scientific American. For machines or rights, address S. E. PARSONS, Wilkesbarre, Pa. 22tf

NEW HAVEN MANUFACTURING COMPANY—New Haven, Conn., (successors to Scranton & Parshley) have on hand Power Planers, to plane from 3 to 12 feet; slide lathes from 6 to 18 feet long; 3 sizes of hand lathes, with and without shears; and counter shafts: universal chucks; drill presses, index plates, bolt cutters, and slide rests. The N. H. M. Company also have the right for Harrison's patent Flour and Grist Mill for the term of five years, and are prepared to furnish these superior mills at short notice. They are unequalled by any other mill, and will grind from 20 to 30 bushels per hour, and will run without heating, being self-cooling. They weigh about 1400 lbs., are of the best French burr stone, 30 inches in diameter; are snugly packed in a cast-iron frame, price of mill $200, packing $5. For cuts, prices, and further particulars apply post-paid, as above, or to S. C. HILLS, agent N. H. M. Co., 12 Platt st., N. Y. tf

FOR SALE—An Established Steam Planing Mill and Sash Factory, in one of the healthiest of our Southern cities. There are are Beardslee's, Woodworth's, and Daniel's Planing Machines, of the best make. All of Fay's machines for the manufacture of sashes and blinds. Leaven's Patent Sash Machine, circular saws, &c. The engine is forty horse power, boilers nearly new. One of the proprietors being about to retire from business, the whole or one half will be sold on advantageous terms. Address P. E. HAMM, Esq., City Treasurer's Office, Philadelphia. 22 2*

TO PIPE MAKERS—And Iron Founders generally—G. Peacock's Patent Core Bar, for making all kinds of branches, elbows, curve pieces, or straight pipe of all shapes and sizes. This improvement has been put to the greatest test, never failing to save fifty per cent. Apply to G. PEACOCK, West Troy, N. Y. 22 3*

WANTED—The first 8 Volumes of the Scientific American, or Vol. 1 only. DAVID DAVIDSON, 109 Nassau st, N. Y. 21 3*

UNITED STATES PATENT OFFICE.
Washington, Jan. 26, 1854.

ON THE PETITION of Allen & Wm. A Crowell, of Salisbury, Conn., praying for the extension of a patent granted to them on the 20th day of June, 1840, for an improvement in Churns, for seven years from the expiration of said patent, which takes place on the 20th day of June, eighteen hundred and fifty-four—

It is ordered that the said petition be heard at the Patent Office on Monday, the 29th day of May next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York; and Enquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the 29th day of May next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 22 3

WANTED—A situation by a man that has superintended a machine shop, pattern shop, smith work, boiler making, building steam engines, paper machines, mill gearing, and machinists' tools: is a mechanical draughtsman, and a steady man. Address, post-paid, "W.," York, Pa. 21 2*

FELTING FOR STEAM BOILERS & PIPES—Manufactured by J. H Bacon, Winchester, Mass., for sale at W. & J. MORRISON'S, No. 9 Maiden Lane, N. Y., and T. C. BACON & CO.'S, corner of Union and North sts, Boston, Mass. 21 6*

LAWRENCE SCIENTIFIC SCHOOL—Harvard University. The next Term of this Institution will open on the second day of March, 1854, and continue 20 weeks. Instruction by Recitations, Lectures, and Practical Exercises, according to the nature of the study, will be given in Astronomy by Messrs. Bond, Botany by Prof. Gray, Chemistry, analytical and practical by Prof. Horsford, Comparative Anatomy and Physiology, by Prof. Wyman, Engineering by Prof. Eustis, Mathematics by Prof. Pierce, Mineralogy by Prof. Cooke, Physics by Prof. Lovering, Zoology and Geology by Prof. Agassiz. For further information concerning the School application may be made to Prof. E. N. HORSFORD, Dean of the Faculty, Cambridge, Mass. 21 4*

AMERICAN RAILROAD JOURNAL—This Journal, the oldest in the world devoted to the Railroad interest, will hereafter contain, in addition to its usual contents, a full and comprehensive department of Railway and Mechanical Engineering, prepared under the direction of a practical engineer and mechanic.—Improvements in Railways, Railway Equipments, and especially in Locomotives, will be duly described and illustrated. Inventors and improvers will find the Journal the best advertising medium, as it is taken by nearly all Railroad Companies and Engineers in the country. Published every Saturday at No. 9 Spruce st, by JOHN H. SCHULTZ & CO., at $5 a year in advance. 21 2*

McALLISTER & BROTHER.—Opticians and dealers in mathematical and optical instruments, No. 48 Chesnut st., Philadelphia, Pa.—at the old stand established in 1796 by John McAllister, Senr. Mathematical instruments separate and in cases, Tape Measures, Spectacles, Spy Glasses, Microscopes, Thermometers, Salometers, Hydrometers, Magic Lanterns, &c., &c. Our illustrated and priced catalogue are furnished on application, and will be sent by mail free of charge. 10tf

WANTED—A good permanent situation, either to run a stationary engine or take charge of machinery, where capability and a faithful discharge of duty would meet with a liberal recompense, by a person who is and has been for several years past, running a locomotive on one of the railroads out of New York. Good references given. Address J. C. GORDON, 438 Fourth Avenue. (On parle Francais.) 21 4*

SHINGLE MACHINES—Wood's patented improvement in Shingle Machines, is unquestionably the best ever offered to the public. The undersigned is now at the West, offering rights in this machine for sale. It is a rare opportunity for a safe and profitable investment in a machine without a rival, for the purpose to which it is applied. Parties wishing to correspond with me can do so by addressing J. D. JOHNSON,
21tf Bridgeport, Ct.

FOR SALE—140 Acres of Choice Land, situated within 1 mile of Wooster, O., on the O. and P. R. R. There is on the premises a woolen factory and one set of machinery: the water power is always sufficient for one set, and for two-thirds of the year for much more. There is also a good saw mill and dwellings for operatives. Terms—One half down and the balance to suit purchaser. THOMAS STIBBS, Wooster, Ohio. 20 3*

2000 BOOKS AND PRINTS—STEARNS & CO'S Mammoth Catalogue of Books and Prints, will be sent GRATIS to all who may order it. It is invaluable as a work of reference. Postage on the Catalogue only 3 cts. Address STEARNS & CO., 17 Ann street, N. Y. 19 4

EUROPEAN PATENTS.—MESSRS. MUNN & CO. pay especial attention to the procuring of Patents in foreign countries, and are prepared to secure patents in all nations where Patent Laws exist. We have our own special agents in the chief European cities; this enables us to communicate directly with Patent Departments, and to save much time and expense to applicants

MINING MACHINERY—Of most approved construction, furnished by FRED'K COOK & CO, Hudson Machine Works, Hudson, N. Y. 15 6m

CLOCK'S FOR CHURCHES, COURT HOUSES, &c.—Regulators for Astronomical purposes, Jewellers; also Time Pieces for Session Rooms, Railroad Stations, Offices, &c., which for accuracy of time and durability have proved (it is believed) equal to any made in Europe or this country. Glass Dials for illumination, and other kinds furnished. Address SHERRY & BYRAM, Oakland Works, Sag Harbor, N. Y. 10eowtf

MACHINERY.—S. C. HILLS, No. 12 Platt-st., N. Y. dealer in Steam Engines, Boilers, Iron Planers Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's, and Law's Planing Machines; Dick's Presses, Punches, and Shears; Morticing and Tennoning Machines; Belting; Machinery Oil, Beal's Patent Cob and Corn Mills; Burr Mill and Grindstones; Lead and Iron Pipe, &c. Letters, to be noticed, must be post-paid. 1tf eow

1854. WOODWORTH'S PATENT PLANING, Tonguing, Grooving, Rabeting, and Moulding machine.—Ninety-nine hundredths of all the planed lumber used in our large cities and towns continues to be dressed with Woodworth's Patent Machines. Price from $150 to $800. Two machines are at the Crystal Palace. For rights in all parts of New York and Northern Pennsylvania, apply to JOHN GIBSON, Planing Mills, Albany, N. Y. 18eowtf

IRON FOUNDERS' MATERIALS, viz: Pulverized Sea Coal, Black Lead, Soapstone, Anthracite and Charcoal Facings. Also, best imported Fire Bricks, Fire Clay, Fire Sand, and Moulding Sand, for sale by G. O. ROBERTSON,
13 13eow 125 Water street, corner of Pine.

THE NEW YORK WEEKLY SUN—Established in 1836, is the first dollar-a-year Weekly Newspaper ever published. Independent of all political parties and cliques, sustained by all the resources of the Sun Establishment in its collections of the latest news from every part of the world, ever offering something new in the way of stories and bon-mots, reports of Inventions, Prices Current, Markets, Recipes, Marriages and Deaths, etc., it is undoubtedly the best as well as the cheapest Newspaper in the world. Nearly every number of the Weekly Sun contains one or more pictorial embellishments, which, of themselves, offer a fair equivalent for the price of subscription. The postage to any place in the State of New York is only 13 cents per year; out of the State, but in the United States, 26 cents a year. For a single copy, one year, in advance, $1; club of 6 copies, $5: club of 13 copies, $10; club of 20 copies, $15. Specimen copies sent gratis when desired. MOSES S. BEACH, Publisher, corner of Nassau and Fulton sts, New York City. 19tf

WEIGHING AND PACKING MACHINE—This machine is particularly adapted for the weighing and packing of ground spices, coffee, teas, saleratus, cream tartar, British luster, arrowroot, drugs, prepared flour, farina, starch, cocoa, oat meal, yeast powders, seeds, snuff, ground herbs, or any like material, which may require to be put in packages, from ounces to pounds. Its advantages over the old method of packing by hand, are manifest. One of these machines will, with the aid of one person, weigh accurately, and pack neatly, from 4to 5,000 packages per day. It requires very little power to run it, and is not liable to get out of repair. Having purchased the exclusive right to manufacture and sell throughout the United States, we are prepared to execute orders for the machines or sale of sectional rights, on reasonable terms. N. B. HARRIS & Co., Proprietors of the Excelsior Steam Spice Mills, Philadelphia, Pa. 12 13

PORTABLE STEAM ENGINES—GEORGE VAIL & CO., Speedwell Iron Works, Morristown, N. J., LOGAN VAIL & CO., No. 9 Gold st, N. Y., are prepared to furnish Portable Steam Engines from four to eight horse power, with locomotive boilers. These engines are recommended for their simplicity, durability, and economy, being made from the best materials and designed for practical use. They are placed on wheels convenient to be moved from place to place, and are shipped in working order: for plantation use, machinists, or others wanting small power, these engines will be found superior to any others in use. A Silver Medal was awarded at the late Fair of the American Institute, and a premium in cash of $100 at the Maryland State Fair, held at Baltimore in October last. Persons writing us by mail will be particular to give their address in full. 21tf

1854—MICHIGAN CENTRAL R.R. LINE—D. W. WHITING, Freight Agent for R.R. and the enormous new steamers "Plymouth" and "Western World," and also General Forwarder, will forward freight of any kind, by any mode of conveyance, to any destination, with dispatch and at the lowest rates; has trucks and machinery (having been a practical machinist has all the skill necessary) for the safe and expeditious handling of any machine or heavy article, such as Locomotives, Steam Engines and Boilers, Engine Lathes, Church Bells, Safes, &c. Mark packages care "D. W. Whiting, Buffalo;" goods thus consigned take precedence with the above boats in all cases. 19tf

IRON DRILLS.—Portable drills for drilling iron.—They are the most simple and convenient drill in use, having a newly invented feed motion, simple and efficient in its operation. They are constructed of iron, and weigh 80 lbs. We can recommend them as a first rate article. Price $25. Address MUNN & CO., at this office.

JOHN PARSHLEY, No. 5 and 7 Howard st., New Haven, Ct., manufacturer of Machinists' Tools, and Steam Engines, has now finishing off 25 Engine Lathes, 6 feet shears, 4 feet between centers, 15 inches swing, and weighs about 1100 lbs. These Lathes have back and screw gear, jib rest, with screw feed, and the rest is so arranged that the tool can be adjusted to any point the work may require, without unfastening the tool, hence they possess all the good qualities of the jib and the weight lathe: they are of the best workmanship. Price of Lathe with count shaft and pulleys, $155 cash. Cuts, with full description of the lathe, can be had by addressing as above, post-paid. Also four 30 horse power vertical Steam Engines with two cylinders. Price of engine with pump and heater, $800 cash. For particulars address as above. 19tf

BAKER'S IMPROVED STEAM BOILER FURNACE, as used at the Crystal Palace, &c. Apply to J. AMORY, 28 State st, Boston, General Agent. 11 tf

C. B. HUTCHINSON'S PATENT STAVE Cutting Machines—The best in use, and applicable alike to thick and thin staves, for barrels, hogsheads, &c.; also his Head Cutting and Turning, and Stave Jointing and Crozing Machines. This machinery reduces the expense of manufacturing at least fifty per cent. For machines or territorial rights, apply to C. B. HUTCHINSON & CO., Syracuse, N. Y. 2tf

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic, Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc., etc.

20 tf CHARLES W. COPELAND,
Consulting Engineer, 64 Broadway.

PLANING, TONGUING, AND GROOVING—BEARDSLEE'S PATENT.—Practical operation of these Machines throughout every portion of the United States, in working all kinds of wood, has proved them to be superior to any and all others. The work they produce cannot be equalled by the hand plane. They work from 100 to 200 feet, lineal measure, per minute. One machine has planed over twenty millions of feet during the last two years, another more than twelve millions of of feet Spruce flooring in ten months. Working models can be seen at the Crystal Palace, where further information can be obtained, or of the patentee at Albany, N. Y
1 tf GEO. W. BEARDSLEE.

A. B. ELY, Counsellor at Law, 52 Washington street, Boston, will give particular attention to Patent Cases. Refers to Messrs Munn & Co., Scientific American. 16tf

LEONARD'S MACHINERY DEPOT, 109, Pearl st., and 60 Beaver, N. Y.—Leather Banding Manufactory, N. Y.—Machinist's Tools, a large assortment from the "Lowell Machine Shop," and other celebrated makers. Also, a general supply of mechanics' and manufacturers' articles, and a superior quality of oak-tanned Leather Belting. P. A. LEONARD.
1tf.

LOGAN, VAIL & CO., No. 9 Gold st., New York.—Agency for Geo. Vail & Co., Speedwell Iron Works, Morristown, N. J., furnish and keep on hand Portable Steam Engines of various sizes, Saw and Grist Mill Irons, Hotchkiss's Water Wheels, Iron Water Wheels of any size, Portable Saw Mills, complete; Bogardus's celebrated Planetary Horse Powers; heaving forgings and castings for steamboats and rolling mills, Ratchet Drills of superior quality for machinists, Saw Gummers, Hand Drills, Tyre Benders, and shafting and machinery generally.
39 1y

NORRIS WORKS, Norristown, Pa. The subscribers build and send to any part of the United States, Pumping, Hoisting, Stamping, and Portable Engines, and Mining Machinery of every description.
41 1y.* THOMAS, CORSON & WEST.

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Scientific Museum.

Artificial Silicification of Limestones.

It is some years since M. Kuhlmann of Lille proposed to preserve pieces of sculpture, etc., by impregnating them with a solution of silicate of potash. This process has been used on a grand scale in certain parts of the cathedral Notre Dame. The architect of the cathedral reports as follows: 1, that the infiltration of silica has preserved the stone from the green moss that covers stones in moist places; 2, that the gutters and flagging of limestone subjected to this process present surfaces perfectly dry, covered with a silicious crust: 3, that upon the stones so prepared, dust and spider webs are less common than upon the stone in the ordinary state. The report also states that tender stones have been rendered hard; they have lost part of their porosity, and after being washed, they dry more rapidly than stones not silicified. The process has succeeded completely on all calcareous blocks, whether isolated or forming part of the structure, new and old.

It is not yet known how this process will act on mortars; but if successful, the silicification of an entire monument may be accomplished, and its restoration when old. The old exterior might be thus covered with a thick bed of artificial silicate of lime, and a whole edifice be protected by this means from all atmospheric causes of destruction.—[Silliman's Jour.

The Assyrian Empire.

A letter was read from Colonel Rawlinson, at a late meeting of the Royal Asiatic Society, detailing his progress in the work of collecting and interpreting the Assyrian inscriptions. He considers it now to be pretty well established that the Assyrian empire was founded about 1250, B. C. The Assyrian empire must now be considered comparatively modern, and any real antiquity must be sought for in the ante-Assyrian period. The names of three more Assyrian kings have been discovered, which must be interposed between Tiglath Pileser and the original founder of Caleh, but the list cannot yet be regarded as complete, and he fears that the obscurity in which the genealogy is involved cannot be cleared up until a complete tablet of dynastics or more bricks are discovered. From the tablets and syllabaria he has made out a list of some 300 or 400 monograms, with their explanations; but he feels quite bewildered at the immensity of the work, as the number of ideographs and compound signs surpass all belief. In one tablet he has found a regular catalogue of all the gods of Assyria and Babylonia, and of the temples and cities in which they were worshipped. This list, although only a fragment contains nearly 500 names. Mr. Hormugd Rassam was to work with 100 men at Kileh Shergat during the whole of November.—Colonel Rawlinson mentions the discovery of a third obelisk at Nineveh. The historical part of this obelisk is very interesting, as it commemorates the exploits of a naval expedition in the Mediterranean, which set out from Adradus in thirty-four Phœnician vessels, and advanced as far as the Grecian Archipelago.

The Thoroughly Educated.

A man entering into life, says Mr. Ruskin, ought accurately to know three things,—First, where he is; secondly where he is going; thirdly, what he had best do under these circumstances. First, Where he is—that is to say, what sort of a world he has got into; how large it is? what kind of creatures live in it, and how; what is it made of, and what may be made of it. Secondly, Where he is going—that is to say, what chances or reports there are of any other world besides this; and whether, for information respecting it, he had better consult the Bible, Koran, or Council of Trent. Thirdly, what he had best do under these circumstances—that is to say, what kind of faculties he possesses; what are the present state and wants of mankind; what is his place in society; and what are the readiest means in his power of attaining happiness and diffusing it. The man who knows these things, and who has had his will so subdued in the learning them, that he is ready to do what he knows he ought, I should call educated, and the man who knows them not, uneducated, though he could talk all the tongues of Babel.

[For the Scientific American.]

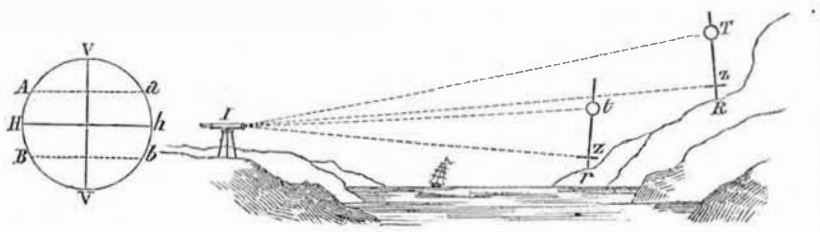
Measuring by Inspection.

It is very desirable for surveyors and civil and military engineers to be able to measure distances at once, and by simple inspection, especially on rough ground. In fact the usual mode of measurement with a chain and pins has always seemed to me a clumsy contrivance, tedious, expensive, and very liable to error.

The annexed engraving and description is a mode of ascertaining distances, by inspection merely, which was invented by me more than twenty years since, and employed in measuring distances less than 1000 feet, with an error not exceeding one-twentieth of one per cent., which is much less than the usual error of the chain, especially over uneven surfaces. I never used it to measure greater distances, although the principle will apply just as well to them.

The principle (one of the properties of similar triangles) is so well known, and its application so very simple, that it may have been used by others, though I am not aware of it. It has saved me some labor and expense in surveying in an open country, and is now handed over to the public that it may find its own level, and hoping, with the natural partiality of an inventor, that it may find a good many of them.

The circle, fig. 1, represents the field of view of the telescope of a theodolite or leveling instrument, with the usual horizontal and vertical cross-wires, H *h* and V *v*. A *a* and B *b*, are two additional horizontal wires, placed at such a distance apart (to be adjusted by experiment,)



that at 1000 feet their angle will subtend a chord of ten feet.

In figure 2, I represents the point on the telescope where the rays cross for the first time (to be marked on the outside), being the initial point of the triangle and of measurement. R represents a rod divided into feet and decimals. *z* is a fixed target at the zero point of measurement on the rod, with a + or other contrivance for adjusting the rod at right angles with the line from *z* to I. Now the angle at I, being always the same, and *z* always a right angle, if when the rod is at R (1000 feet distant from I) the lower wire (B *b* fig. 1) cuts the target, *z*, at zero, and the upper wire (A *a*, fig. 1) cuts the sliding target, T, at 10 feet above, then if the rod is removed to *r*, the lower wire (B *b*, fig. 1) being adjusted to the target, *z*, and the upper wire (A *a*, fig. 2) cuts the sliding target, *t*, at 6 84-100 feet above the point, *r*, is 684 feet from I, and so for a greater or less distance, the base of the triangle, *z* I being always 100 times the perpendicular, *z* T.

If this mode is used for long distances, the wires, A*a* and B *b* may be vertical, and hundredths of feet on a tape line stretched horizontally at right angles with the line from the telescope to the rod, will give the distance, *z* I, in feet.

If a theodolite is used, the horizontal and vertical distances can be ascertained as well as the actual distance, all at one observation, and thus topographical surveys made with great accuracy and rapidity.

JAS. T. WORTHINGTON.

Chillicothe, Ohio, 1854.

New Kinds of Galvanic Batteries.

The combination used in one of these, is antimony, or some of its alloys, for a negative plate, with nitric acid of specific gravity 1·4, in contact with it, and unamalgamated zinc, for a positive plate, with a saturated solution of common salt in contact with it. A small quantity of finely powdered per-oxide of manganese is put into the nitric acid, which is said to increase the constancy of the battery. The alloys of antimony which Mr. Kukla has experimented with successfully are the following:—Phosphorus and antimony, chromium and antimony, arsenic and antimony, boron and antimony.—These are in the order of their negative character, phosphorus and antimony being the most negative. Antimony itself is less negative than any of these alloys. The alloys are made in the proportions of the atomic weights of the substances. All these arrangements are said by Mr. Kukla to be more powerful than when platinum or carbon is substituted for antimony or its alloys. In this battery a gutta percha bell cover is used over the antimony, resting on a flat ring floating on the top of the zinc solution,—this effectually prevents any smell, and keeps the per-oxide of nitrogen in contact with the nitric acid solution. When a battery of twenty-four cells was used, Mr. Kukla found that in the third and twenty-first cells pure ammonia in solution was the ultimate result of the action of the battery; but only water in all the others. This experiment was tried repeatedly, and always with the same result. A battery was put into action for twenty-four hours,—at the end of that time the nitric acid had lost thirteen-twentieths of an ounce of oxygen, and one-quarter of an ounce of zinc was consumed. Now as one-quarter of an ounce of zinc requires only 0·06 of an ounce of oxygen to form oxide of zinc, Mr. Kukla draws the conclusion, that the rest of the oxygen is converted directly into electricity; and this view, he says, is confirmed by the large amount of electricity given out by the battery in proportion to the zinc consumed in a given time. In the above battery each zinc plate had a surface of forty square inches. The addition of per-oxide of manganese does not increase the effect of the battery, but it makes it more lasting—the per-oxyd of nitrogen, formed in the bell cover, taking one atom of oxygen from the per-oxide of manganese; this is evident from only the oxyd of manganese being found in the battery after a time: in the salt solution no alteration takes place but what is caused by the oxyd of zinc remaining in a partly dissolved state in the solution. For this battery Mr. Kukla much prefers porous cells, or diaphragms of biscuit ware, as less liable to break, and being more homogeneous in the material than any other kind. This battery is very cheap, the zinc not requiring amalgamation.—The second arrangement tried by Mr. Kukla was antimony and amalgamated zinc with only one exciting solution, viz. concentrated sulphuric acid:—this battery has great heating power, and the former great magnetizing power:—it, however, rapidly decreases in power, and is not so practically useful as the double fluid battery, which will exert about the same power for fourteen days, when the poles are only occasionally connected as in electric telegraphs. Certain peculiarities respecting the ratio of intensity to quantity when a series of cells is used, have been observed, which differ from those remarked in other batteries.—[London Athenæum.

We think Mr. Kukla must have been mistaken in his quantitive analysis. We cannot believe without further evidence that oxygen can be converted into Electricity, for if this be so, either oxygen is not a simple substance or oxygen and electricity are identical. Besides, there is a very wide difference between the ponderables and the imponderables in many important respects, so great a difference indeed, that we shall be slow to believe in their convertibility.

Satisfactory Evidence of Vitality.

The Durham Chronicle, an English paper, says that in the early part of December the proprietors of Wombwell's travelling menagerie, which was then in that vicinity, became very much afraid that their famous boa constrictor would die of cold. They accordingly placed two young crocodiles in the box beside it in order to impart heat, and then wrapped the three in flannel. Soon after, when the keeper went to examine his charge, he found that the boa had swallowed one of the crocodiles!

LITERARY NOTICES.

THE ILLUSTRATED HYDROPATHIC QUARTERLY REVIEW—Published by Fowlers & Wells, 131 Nassau street, at $2 per annum. The subject of Water Cure has elicited for some years a great amount of public attention, and these enterprising publishers were the first to spread among our people sound views concerning its proper use. The work before us is ably managed, and the general making up is excellent.

THE BIBLIOTHECA SACRA—We have received the January number (1854) of this able religious Review, published by A. F. Draper & Brother, Andover, Mass: it contains nine excellent original articles by clergymen, some of which articles exhibit a great amount of learning and keen logic. By our foreign exchanges we perceive that two great men in the Congregational Church have recently been called away to join the General Assembly above, we mean Dr. Ralph Wardlaw and Dr. Alexander, of Scotland—the latter, one of the editors of this Review. He was a very learned and pious man. A brief review of Dr. Beecher's "Conflict of Ages." is unfavorable to the theory set forth in said work. One article on the "Food of Man," affords us much useful information.

HAND-BOOK OF GERMAN LITERATURE—Is the title of a book just issued from the press of D. Appleton & Co. It contains Schiller's "Maid of Orleans," Goethe's "Iphigenia in Taurus," Tieck's "Puss in Boots," the "Xenia," by Goethe and Schiller, with various specimens of German prose. Edited by G. J. Adler, Prof. of German in the N. Y. University.

A new edition of "Les Aventures de Telemaque" has been issued by the same publishers. Its typography is clear and it is well bound. The Messrs. Appleton have lately opened a new store at Nos. 346 and 348 Broadway, The same enterprising publishers have also issued a manual of the French verbs, by T. Simonne, Prof. of Languages. Their publications are all creditable to them.

John B. Wickersham, Esq., No. 312 Broadway, New York, has just published an illustrated catalogue, entitled "A New Phase in Iron Manufacture," embracing a description of its uses for inclosing public squares, cemetery lots, dwellings, cottages, gardens, offices, gratings for stores, prisons, etc., window guards, bedsteads, tree boxes, verandahs, and articles of furniture, of which he is a large and enterprising manufacturer. The work is well got up, and will be useful to all interested in such matters.

BIBLICAL REPERTORY AND PRINCETON REVIEW—The January number of this able Review of the Presbyterian Church. Prof. Hodge, of Princeton College, Editor, contains six powerful original articles on various subjects: one on Dr. Beecher's new work, the "Conflict of Ages," will be read with great interest; it speaks of the author with respect, and deals with the work in a spirit of christian candor. This Review is published at Philadelphia.

THE NEW YORK MONTHLY—Is the name of a new Magazine which we have just received: Griffin & Farnsworth, the well-known editors of the "New York Dutchman," are the conductors of this new competitor for public favor. It is a spirited journal and we predict for it a large circulation. C. Reagles, publisher, 208 Broadway.

LITTELL'S LIVING AGE—Every number of this excellent weekly Magazine, is embellished with a beautiful steel engraving. Published by Littell, Son & Co., Boston, Mass.

SMITHSONIAN INSTITUTE REPORTS—We are under obligations to Prof Booth, for Reports and Transactions of this Institution. The Report on improvements in the "Chemical Arts," by Profs. Booth & Morfitt, is really a most useful and able work; it does great credit to those able chemists.

Putnam's Monthly for February has been received. Its table of contents is very interesting this month. The enterprising publishers are determined not to be eclipsed by any of their rivals.

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